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ON-TASK BEHAVIOR OF HANDICAPPED AND NONHANDICAPPED CHILDREN IN AN INTEGRATED PRESCHOOL

A Dissertation Presented

By

SIGNIA RIX WARNER

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ABSTRACT

On-task Behavior of Handicapped and Nonhandicapped Children in an Integrated Preschool

(February 1984)

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The purpose of this study was to investigate the impact of several environmental variables on children's task involvement in an integrated handicapped, nonhandicapped preschool. Differences between on-task behavior of handicapped and nonhandicapped children were examined. The predictive strength of teacher role, child group size, and activity or learning area of the classroom for the dependent variable Focus on Task was measured.

Data were gathered during four two-week observation periods in fall 1979, spring 1980, fall 1980, and spring 1981 using a time-series observation technique. Post-hoc analysis of data from this integrated preschool sponsored by the Franklin County Education Collaborative in Massachusetts and the Office of Special Education and Rehabilitation in Washington D.C., produced the four major findings:

1. There was a significant increase in on-task behavior from fall 1979 to spring 1980, and a substantial but not statistically

significant increase in on-task behavior from fall 1980 to spring 1981.

2. There was no significant difference between handicapped and nonhandicapped children's on-task behavior in general. However, there was a significant difference in on-task behavior in the fall of each year between five handicapped children who lacked productive speech and all other handicapped and nonhandicapped children.

3. There was no correlation between a standardized measure of cognitive ability and Focus on Task for either handicapped or nonhandicapped children.

4. The role of the teacher was not the best predictor of task involvement for children in the integrated preschool under study. Handicapped children were not observed Focused on Task most often when the teacher was Directing their activity. Activity/Learning Area of the classroom was the best predictor of on-task behavior of children across all four time periods.

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CHAPTER I

INTRODUCTION

Minority group rights to equal education were extended to handicapped children in the 1970s through a series of litigations culminating in the Education for All Handicapped Children Act of 1975 (Public Law 94-142). The Education for All Handicapped Children Act guarantees a free appropriate public education to all handicapped children from three years of age. It stipulates that handicapped children must be educated to the maximum extent possible with their nonhandicapped peers (Shrybman, 1982). Although Congressional underfunding has weakened its impact (Levine & Wexler, 1981), Public Law 94-142 is still considered a landmark piece of legislation.

Educational placement of handicapped children in the least restrictive alternative is often operationalized through mainstreaming (Semmel, Gottlieb, & Robinson, 1979). Mainstreaming is defined in various ways but generally agreed upon aspects of mainstreaming include: (a) temporal and social integration of handicapped children with their nonhandicapped peers; (b) ongoing individual educational planning and assessment; and (c) shared responsibility for the educational programs of special needs children between regular and special education personnel (Kaufman, Gottlieb, Agard, & Kukic, 1975).

Because it is a complex process involving classification systems, referral and placement services, legal policies, administrative

support, individualized curriculum, parent consultation, regular classroom teachers, special educators, and therapists (Paul, Turnbull, & Cruickshank, 1977), mainstreaming must be evaluated on different levels. An ecological paradigm facilitates investigation into the interconnectedness between the developing child and the surrounding ecosystems (Apter, 1977; Bronfenbrenner, 1979; Gordon, 1978). The emphasis of ecologically oriented investigation is on establishing ecological congruence between the handicapped child and the behavior setting rather than focusing on a deficit of the child (Thurman, 1977). This is in sharp contrast to the physiological model which views a handicap as residing entirely within the child, ignoring characteristics of the physical environment which may shape and mediate the way in which the handicapped child is able to function.

Bronfenbrenner (1977) conceives of the ecological environment as a nested arrangement. Adapting Brim's (1975) terminology, Bronfenbrenner examines the relationship of the developing individual to the macro-, exo-, meso-, and microsystems. The ideology or belief systems of the culture, such as general attitudes toward handicaps, comprise the macrosystem. Physically removed settings which continue to affect the child such as the placement and referral services which place the child in a mainstreamed educational setting, combine to make up the exosystem. The relationship among two or more settings such as the home and the school in which the child actively participates constitutes the mesosystem. The microsystem consists of immediate settings with particular physical and material

characteristics and a pattern of activities, roles, and interpersonal relations. Because of its immediate, direct influence on the child, the microsystem is perhaps the most important ecological system (Day, 1983).

Various units within the microsystem have been defined by psychologists interested in developing an eco-behavioral science. Gump (1975) conceptualized environmental segments within schools as consisting of milieu features and program features. The location of the art area with easel, paper and paints are examples of milieu features. Space allocation, time during which the area is used, and the way it is used are examples of programmatic features. The synomorph, an eco-behavioral unit proposed by Barker (1955) includes both milieu and program features. Synomorph is a generic term for stable parts of the environment consisting of: (a) a standing pattern of behavior; (b) a portion of the physical milieu; (c) a time-space loci; and (d) the interrelationship between these components (Barker, 1955). Standing patterns of behavior are extraindividual (Barker & Wright, 1978). For example, in a preschool art area, children put on a smock, make sure paper is on the easel, dip the paintbrush into the paint and so forth. This pattern of behavior persists even when the art area is used by different children.

The behavior setting is the combination of the standing behavior pattern and the milieu to which the behavior is attached and with which it has a synomorphic relationship (Barker & Wright, 1978). Although the same type of behavior is frequently observed even when the participants of a behavior setting change, the ecological

perspective should not be misinterpreted as a behavioristic model with environment shaping human behavior (Day, 1983). The ecological model is grounded in Lewin's phenomenological conception of the environment wherein behavior (B) is a function (F) of the person (P) and her interaction with the environment (E). In his formula B = F (P, E), Lewin (1951) conceptualized the person and environment as interdependent. How a child perceives the physical setting depends upon her own immediate emotional state, developmental status, character, and ideology as well as upon objective environmental criteria. In order to understand and predict behavior the total "life space" consisting of both the person and his psychological environment must be considered (Lewin, 1951).

Statement of the Problem

Teachers are aware that social and environmental factors affect the performance of children but are usually unable to pinpoint specific environmental inputs of behavior. Unless the influence of environmental variables upon children's behavior are known, teachers are forced to rely on trial and error methods of restructuring the environment. This study is designed to investigate the on-task behavior of handicapped and nonhandicapped children within a variety of microsettings in a mainstreamed preschool environment. Differences between on-task behavior of handicapped and nonhandicapped children are examined under altered conditions. The predictive strength of

teacher role, child group size, and activity or learning area of the classroom for the on-task behavior of young exceptional and typical children is measured.

Design of the Study

From 1979 to 1981, the behavior of 27 handicapped and nonhandicapped children was observed in their daily routine at Side-By-Side, an integrated preschool located in a small rural community in Western Massachusetts. Observations of the children's behavior were recorded using The Behavior Checklist of Child-Environment Interaction (Day, Perkins, & Weinthaler, 1978), an instrument specifically designed for formative evaluation in early childhood education settings. Frequency counts of 33 operationally defined behaviors were gathered in the fall and spring of each of two consecutive program years. On-site interrater reliability was established prior to each observation period. After agreement of 80% or better was consistently maintained, children were randomly selected for observation. Forty 30-second observations were scheduled for each child on successive days at half hour intervals during free play and structured group activity. The observations were conducted during two-week periods in November 1979, May 1980, October 1980, and May 1981 (Warner & Day, 1982).

Research Hypotheses

This study is concerned with the impact of three environmental variables on the frequency of handicapped and typical children's task involvement: (a) the role of the teacher; (b) the size of the child group; and (c) the activity or learning area of the classroom where the behavior occurs. Four research hypotheses concerning the frequency of on-task behavior of handicapped and nonhandicapped children in an integrated preschool were tested.

Research hypothesis 1

The mean percent of on-task behavior will not change significantly from the first observation period in the fall of the academic year to the second data gathering period in the spring near the end of the preschool year.

Research hypothesis 2

A number of researchers (Bryan, 1974; Bryan & Wheeler, 1972; Forness & Esvelt, 1975; Montemurro, 1980) have reported that time on-task for handicapped children was lower than time on-task for nonhandicapped children. Therefore, it is predicted that a statistically significant difference will exist in the mean percent of observed on-task behavior between handicapped and nonhandicapped children at each of the four observation points.

Research hypothesis 3

It is commonly assumed that the behavior of the teacher is the most important predictor of children's classroom behavior and that handicapped children require more teacher direction. It is therefore hypothesized that the behavior of the teacher--whether she is Absent, Observing, Participating or Directing--will be the best predictor of task orientation of children in this integrated preschool. In addition, it is hypothesized that teachers will be observed directing significantly more often when handicapped children are coded on-task.

Research hypothesis 4

The ecological perspective maintains that the organization of the classroom environment is a significant influence on the behavior of its occupants. It is hypothesized that the behavior setting or area of the classroom will be an important predictor of children's on-task behavior for both handicapped and nonhandicapped children.

Definition of Terms

The coding categories utilized in this study are those defined in The Behavior Checklist of Child-Environment Interaction (Day, et al., 1978).

Activity area description sheet

An Activity area description sheet was completed for each

activity area prior to the observation period in the fall of each year. It describes the location of the learning area in relation to other adjacent learning areas, the number of children allowed to use the area simultaneously, the expected role of the adult, the anticipated behavior of the child while engaged in the area, the materials and equipment available, the time of day when the activity area is available for use, and the purpose of child development goals of the area. Activity area description sheets document the purpose and physical attributes of an area prior to the observation process in order that relationships which may exist between behavior and environment can be reliably analyzed.

Adult role

When the adult is absent from the area, a code of 1 is assigned to the child's observation checklist. When the adult is observing, the child is coded as a 2 in this category. If the adult is judged to be participating with the child, a code of 3 applies. When the adult is clearly directing the child's activity, a code of 4 is assigned.

Focus on task

The child is considered to be focused on task when involved in an activity, task or project alone, with other children, or with adults. The child must be clearly focused on the materials, the activity or the persons included in the task or activity. She may

be concentrating on a puzzle or a block construction or playing with another child while other children nearby are engaged in another type of activity. The task may be sedentary or an active game involving running or riding a tricycle.

Group size

There are four group size categories which are coded from 1 to 4: A code of 1 indicates that the child was observed alone in solitary activity; 2 shows that the child was engaged in a group activity with a small group of 2 to 5 children; 3 codes the child as engaged with a group of more than five but fewer than the whole group; and 4 is usually coded in circle time activities when the total group is gathered together.

Learning or activity area

An essential part of the procedure for the Naturalistic Evaluation for Program Improvement (Day, Perkins, & Weinthaler, 1979), is the definition of activity areas. Kurt Lewin understood the necessity of defining the "boundary conditions" of the "nonpsychological data" before attempting to analyze the behavior of individuals or groups (Lewin, 1951). Most early childhood learning environments contain activity areas which are provided to promote child development in many different social, physical and cognitive domains. Typically, early learning environments contain a fine motor area equipped with puzzles, Leggos, playdough and other activities which help to develop

cognitive and fine muscle skills. Activity areas may include a block area, a gross motor area, an area specifically designed for snack or lunch. Gross motor activity is often provided inside as well as outside on the playground. There are variations in the types of activity areas provided and some areas may serve different purposes at different times of the day. For example, at the integrated preschool under study, the snack area served as the art area during a large portion of the morning. The same tables were used but the group size, behavior of the children, materials available, and teacher role were altered.

Mainstreaming

Mainstreaming in the context of this study refers to informal mainstreaming where special and regular children use the facilities together. In the site investigated, approximately half of the children were diagnosed as moderate or severe special needs children.

Public Law 94-142

Public Law 94-142 specifies that all handicapped children who are mentally retarded, hard of hearing, deaf, orthopedically impaired, other health impaired, speech impaired, visually handicapped, seriously emotionally disturbed, or children with specific learning disabilities between the ages of 3 to 21 inclusive are entitled to a free and appropriate education in the least restrictive educational environment (Public Law 94-142, 1975).

Limitations of the Study

While the present study offers a unique opportunity to analyze the relationship of environmental variables to task involvement in a fully integrated preschool, the results have limited applicability to other mainstreamed preschool programs and must be considered in the context of a longitudinal case study without generalizability.

Attrition was not a critical factor in this study. Data are missing for one handicapped child and one nonhandicapped child during the second observation period in the spring of 1980 and for one handicapped child who was vacationing with her foster parents during the fall 1980 observation period.

There is always a possible threat of the Hawthorne effect on external validity. Although precautions were taken to minimize the obtrusiveness of observers in the classroom, their presence is bound to have some effect upon subjects who are knowingly part of a study. The Hawthorne effect was deemed to be a greater threat for teacher behavior ratings than for the ratings of the children's behavior. The young children appeared to be oblivious to the presence of the observers and were accustomed to having classroom visitors.

Overview of Dissertation

Chapter I

Introduction. After a brief introduction of mainstreaming and the ecological paradigm as it applies to mainstreaming, Chapter I presents a statement of the problem, design of the study, four research hypotheses, a definition of terms, and the limitations of the study.

Chapter II

Review of the literature. The literature review is presented in four major sections: (a) Early observational studies of young children's attending behavior; (b) Conceptual shifts in the investigation of attention; (c) Research on teacher behavior; and (d) The development and application of task involvement as a behavior variable.

Chapter III

Methodology. This chapter includes an introduction, a description of the procedure used to collect data, a profile of the subjects, and a description of the statistical procedures used.

Chapter IV

Results. Findings are reported for each research hypotheses, either descriptively or analytically depending on the nature of the

question being addressed.

Chapter V

Summary and conclusions. A summary of the first four chapters will be presented in Chapter V along with a discussion of the implications of the results presented in Chapter IV.

CHAPTER II

REVIEW OF LITERATURE

The review of literature will be presented in four major sections: The first section reviews early observational studies of young children's attending behavior; the second summarizes psychological studies of attention; the third is an overview of teacher behavior research; the final section traces the development and application of task involvement as a behavior variable.

Observational Studies of Attention

Early studies of young children's attending behavior

One of the phenomenon which most interested child development researchers in the late 1920s and early 1930s was the child's attending behavior. Hulson (1930) investigated four-year old children's activity preferences at the Iowa Child Welfare Research Station preschool laboratory. Ten children were observed under conditions of little or no adult direction and their activity choices were recorded. Blocks were the most frequently selected material in this study, sand was next. Dishes, Dolls, Blackboard, and Animals were chosen least often.

Herring and Koch (1930) studied the relationship between interest span of preschool children and several independent variables: age, sex, time of day, toy, length of occupation, and IQ. In this

study, 40 two-year olds and 40 four-year olds were observed during one hour of spontaneous play with prescribed materials in their own homes. Toys provided by the experimenters were: a small iron truck, a book, a top, a lunch box full of acorns, and a tinker toy pull toy. The materials were presented in the same way to each child. The observer recorded the child's activity and clocked the length of interest span in each occupation for one hour. On a separate occasion, the Merrill-Palmer Scale of Mental Tests was individually administered to each child.

These researchers report that average interest span increased somewhat with age. Even though minor distractions were ignored, the average length of interest span reported was short--only one and one-half to two and one-half minutes. Analysis of length of interest span by sex revealed girls to have a shorter average activity span than boys. However, it should be mentioned that variability in length of attention span was greater among the boys.

Children in both age groups preferred the toy truck as indicated by the mean number of times it was used. When analysis of toy preference was done by sex, girls showed a slight preference for the top over the truck in both age groups. The picture book proved to be the least attractive both in terms of number of times used and in average amount of engaged time. IQ and length of interest span were not statistically correlated. Herring and Koch state that their results corroborate Bridges (1927) findings that boys prefer "more active occupations whereas the girls prefer those activities involving

considerable finger work and relatively little shifting in the gross position of the body."

Helen Shacter (1933a) published her study, "Attention of Preschool Children" using 36 subjects enrolled in prekindergarten and kindergarten classes of the Elementary School of Chicago Teachers College. In this study with equal numbers of boys and girls and an equal distribution of 3-, 4-, and 5-year olds, three learning/play situations were structured for simple activity: (a) placing circles in rows by color; (b) dropping pegs into a box; and (c) stacking disks. Three similar situations were offered for complex activities: (a) placing pictures and geometric figures together on a table; (b) dropping pegs and other assorted forms through a hole in a box; and (c) stacking disks and other geometric forms.

Little difference was found in attention span by age. The mean attention span for the simple activity situation was 8 minutes for both three and four-year olds and 9 minutes for the five-year olds. For the complex activities, the three groups averaged 11 minutes, 2 seconds; 12 minutes, 55 seconds; and 11 minutes, 14 seconds for the 3-, 4-, and 5-year olds, respectively. Girls demonstrated a longer period of sustained attention in both the simple and complex situations for all age groups. In another investigation, Schacter (1933b) studied the relationship between IQ and attention span. Stanford-Binet verbal scores, a Merrill-Palmer performance test, and a picture pointing test from the Detroit Kindergarten series were used to test intelligence. Schacter found no relationship between IQ and

attention span.

Collectively these studies are contradictory. Herring and Koch (1930) found boys to have a longer attention span while girls in the Schacter (1933a) study consistently demonstrated a longer attention span across all age groups. Herring and Koch report that interest span increased with age slightly for their 80 2- and 4-year olds, whereas Schacter found little difference in attention span across her 3-, 4-, and 5-year old sample. In the Herring and Koch (1930) study, attention span lasted only one and one-half to two and one-half minutes. Schacter's subjects were involved from 8 to nearly 13 minutes.

Psychological Studies of Attention

Early theory and research

Mostofsky (1968) chides educators for ignoring research on attention. He points to the "firm and long-standing association of attention with learning and schooling" and admonishes educators to become better informed about the psychological research on attention. Psychologists have struggled to define and explain human attention since the beginning of psychology itself in the late nineteenth century. In "A Short Historical Perspective" Boring (1970a) mentions the early contribution of Sir William Hamilton who measured the range and degree of attention. In 1879, in the first experimental psychological laboratory, William Wundt studied adult attention by

asking subjects to talk about their own attending behavior. On the basis of these introspective reports, Wundt postulated the existence of levels of attention arranged on a continuum from a low level of perception to high levels of apperception. This early method of self report of one's own mental activity, known as mentalism, later became disreputable among psychologists.

In Principles of Psychology, first published in 1890, William James devoted an entire chapter to the topic of attention. He is not preoccupied with defining attention since "everyone knows what attention is," but he does differentiate kinds of attention. According to James, there are six varieties of attention: Sensorial, intellectual, immediate, derived or apperceptive, passive or non-voluntary, and active or voluntary (James, 1981, p. 393). James was characteristicly pragmatic about the lasting utility of the concept of attention--so elusive and nebulous--that "attention may have to go, like many a faculty once deemed essential, like many a verbal phantom, like many an idol of the tribe. It may be an escrescence on psychology" (James, 1927).

Professor Titchner of Cornell University refined Wundt's definition of attention as "sensory clearness" and identified qualities associated with it such as intensity, form, temporal relation, movement, novelty, consciousness, and accommodation of sense organs (Titchner, 1908). W. B. Pillsbury, Director of the Psychology Laboratory at the University of Michigan and one of Titchner's students, was interested in the higher mental processes involved in

attending. Pillsbury echoed Freud's view of attention as hypercathexis when he defined attention in terms of changes in conscious states. Pillsbury (1908) points out that attention can be objectively regarded in bodily position, direction of eyes, and other physical signs.

Ribot was intrigued with these observable bodily manifestations of the attention process. Ribot held that attention could be observed in terms of physical states and movements or arrested movements, even in infants. Ribot conceived of two main types of attention: Spontaneous and Voluntary. Too many psychologists were interested in studying only Voluntary attention, Ribot declared. Voluntary attention was conceived of as artificial attention resulting from education, training, and impulsion. Whereas Spontaneous attention is "a gift of nature" and is the only kind of attention existing in animals and young children (Ribot, 1911, p. 6). Ribot believed that the character and fundamental tendencies of any person are revealed in the objects of their spontaneous attention. Voluntary attention, the product of art, education, direction, and training, is grafted onto Spontaneous or natural attention. Whereas Spontaneous attention is intrinsic, Voluntary attention is imposed by extrinsic forces.

Summaries of the history of attention research (Boring, 1970b; Moray, 1969; Swets & Kristofferson, 1970) maintain that after the death of Wundt in 1920 and Titchner in 1927, there was little or no interest in attention in the field of psychology. It is suggested that the conceptual framework of the study of attention and the rise

of behaviorism are responsible.

However, appearing under different rubric, aspects of the attention process continued to stimulate research interest. For example, in his research on classical conditioning, Pavlov studied the "Orienting Response." Freud used free association to coax inaccessible ideas from his patients' unconscious to the conscious mind. Lewin (1935) performed studies of substitution by disrupting the child's attention before task completion and substituting another task. Wyatt and Langdon (1932) researched the performance of individuals on visual inspection tasks. Mackworth (1948) performed laboratory experiments on sustained attention or "Vigilance" in controlled settings. Attention was studied as "Set" by Gibson (1941) and Hebb (1949).

Contemporary attention theory

Broadbent is credited with reinstating the term "attention" in the literature of psychology. Broadbent experimented with selective listening tasks and proposed his "filter theory" of attention. Briefly, this theory argues that when an information overload occurs, a filter is imposed in order to limit input. These filtered inputs may remain in short-term storage and enter the processing system a few seconds later. Novel stimuli and information inputs relevant to the task at hand have a better chance of passing this filter. Pauses or blocks may appear in this processing system causing a decline in performance over time (Broadbent, 1958).

Cherry (1953) introduced the "shadowing technique" in his work on

listening to speech with one and two ears. This technique requires that subjects repeat a message immediately after it is received. The trick is that two competing messages are presented, one in the left and another in the right ear. Subjects were able to repeat in a monotone one of the messages accurately. This ability to attend selectively to speech is known as "the cocktail party phenomenon" (Keele, 1973).

Anne Treisman wrote her doctoral dissertation on Broadbent's filter theory incorporating Cherry's shadowing technique as an experimental technique. Treisman (1960, 1964, 1969) proved that filtering is not a complete blocking of the unwanted stimuli but involves attenuating signals. She was able to show that filtering occurs during, rather than before or after, stimulus recognition. This question of timing of the filtering process is an important aspect of Treisman's work. The research of Deutsch and Deutsch (1963) supports Treisman's conclusion that all messages are cognitively considered and that selection of one occurs at the response level. Neisser incorporated both the Broadbent and Treisman theories in an analysis-by-synthesis theory of attention (Moray, 1969).

Eleanor Maccoby (1967) studied children's age trends in selective listening. She and Konrad (1966) used the shadowing technique on equal numbers of kindergarten, second grade, and fourth grade pupils. The children were instructed to report only the words of one voice tape. The children's ability to correctly report the words spoken by the designated voice increased with age. However, Maccoby (1967)

considers the larger vocabulary of the older children to be somewhat of an influencing factor in the results of her study.

Current conceptual trends in the study of attention

Studies of attention are grouped into three broad categories by Posner and Boies (1971). Their first category, alertness, includes research studies of the connection between time and brain activity (Bertelson, 1967; Karlin, 1970; Naatanen, 1970; Posner & Wilkinson, 1969) as well as literature on vigilance (Mackworth, 1970). The second category, selective attention, includes studies reviewed in the previous section (Broadbent, 1958; Cherry, 1953; Deutsch & Deutsch, 1963; Maccoby, 1967a; and Treisman, 1960; 1965; 1969). Posner and Boies (1971) third category of research on attention includes studies which are directly associated with a limited central processing capacity. The limited central processing capacity model is based on the work of Broadbent (1958) discussed earlier. Limited central processing implies that two operations requiring processing will interfere with one another because only one can be processed at a time.

Posner and Boies (1971) express regret that the experiments used to study each of these components of attention (alertness, selective attention, and limited central processing capacity) are quite different and there has been little attempt to develop experiments which integrate them. In a more recent article, Posner (1982) continues to search for a unifying theme in attention theory. Posner challenges Kuhn's (1962)

analysis of shifting scientific paradigms, arguing instead that in the area of attention theory there has been a cumulative development of theory during the last century.

Review of Teacher Behavior Research

A brief history

Researchers have struggled to identify teaching behavior which affects the performance of students for at least 50 years. Although the bulk of this research focused on specific teacher behaviors which correlated with student achievement or cognitive gains, there have also been attempts to identify teacher behavior associated with affective outcomes such as attitude toward school and self-concept of the student (Rosenshine, 1978).

During the 1940s and 1950s, researchers specified desirable teacher behaviors, traits, and methods supervisors might use to assess teacher competence (Travers, 1978). Thousands of studies are reported in bibliographies on teacher effectiveness (Barr, 1948; Domas & Tiedeman, 1950; Morsh & Wilder, 1954). Travers (1978) criticizes these early studies on the basis of: (a) the use of supervisory ratings and other unacceptable criterion of teacher effectiveness; (b) prejudicial and redundant categories for rating teacher effectiveness; and (c) data contamination resulting from rater imprecision and distortion.

The quest for more objective measures of teacher effectiveness led to an effort to identify teacher behavior associated with student test performance (Travers, 1978). A prime example of this type of research is Morsh's study of air force instructors cited in Travers (1978). Instructors teaching identical subject matter to a homogeneous group of students were rated on behaviors as specific as "writes key term on the blackboard." Disappointingly little relationship was found to exist between the performance of the class on the standardized final examination and the frequency with which specific teacher behaviors were coded (Travers, 1978). Travers points out that in spite of the fact that specific behaviors were unrelated to test performance, some instructors consistently produced higher scoring students. In other words, some instructors apparently were more effective than others but their more competent teaching style could not be reduced to a set of specific behaviors. Morsh found that specific student behavior was a better indicator of the amount of learning taking place than was teacher behavior (Travers, 1978).

Measurement instruments

After the launching of Sputnik in the Soviet Union, the U.S. became concerned about the quality of domestic education and the government began funding research on teaching effectiveness. A plethora of instruments designed to assess and improve classroom teaching emerged. These instruments were designed to measure many different aspects of classroom dynamics. Collections of these

instruments can be found in volumes of Mirrors for Behavior I, II, and III (Simon & Boyer, 1974), and Evaluating Classroom Instruction: A Sourcebook of Instruments (Borich & Madden, 1977).

One of the most popular of the instruments designed to assess teaching behavior was the Flanders System of Interaction Analysis. The Flanders System has been used in early childhood settings as well as at higher grade levels. It consists of ten categories designed to measure verbal interaction in the classroom: seven categories apply to the quantity and quality of teacher talk; three categories code child talk. Researchers using the Flanders System tend to assume that a higher proportion of pupil talk indicates better teaching (Travers, 1978). Normative data show that teachers talk about 70% of the time and students are coded as the talker/initiator an average of 20% of the time. The Flanders device has been attacked for the simplistic educational theory underlying it (Mitchell, 1969; Travers, 1978).

Taba (1966) developed a system of assessing elementary school teachers based on the Bloom Taxonomy of Educational Objectives. This system assumes that an effective teacher will influence the level of cognitive activity in the classroom by raising questions which require students to synthesize and evaluate information as well as questions which require only a factual response. Similarly, Gallagher and Aschner devised a way of measuring the extent to which convergent and divergent thinking are encouraged by teachers. The teacher is coded on the frequency with which she asks open-ended questions as an indication that divergent thinking is being encouraged.

Convergent thought questions are considered those inquiries having only one right answer (Robison, 1983). Travers (1978) concludes that most of the instruments designed to assess teaching effectiveness are based on intuitive opinions of the psychological factors involved in teaching and learning and that these opinions vary among researchers.

While Soar (1983) agrees that the beliefs upon which rating procedures are based are faulty, he continues to advocate the use of observation instruments for measuring educational quality. Soar views classroom quality as synonymous with quality of teaching. Using Mitzel's (1960) categorical framework, Soar reviews research related to teacher behavior in terms of presage measures (teacher IQ, educational status, years experience teaching, etc.); process measures (what happens in the classroom); and product measures (student changes resulting from exposure to an educational setting).

On the basis of his review of the research, Soar (1983) considers presage measures to be relatively weak measures of classroom quality. Indeed, he cites one study (Levin, 1954) which reported higher student achievement in classrooms with teachers who had neither majored nor minored in the subject taught (Soar, 1983). However, Collins (1983) in reviewing the results of the National Day Care Study (Ruopp, Travers, Glantz, & Coelen, 1979), reported contradictory findings. Presage measures were found to be important for providing quality day care in this national study. Children in centers where lead teachers were trained/educated in child related fields were more cooperative and showed greater increases on the Preschool

Inventory Test. In day care centers where a higher proportion of the staff had backgrounds in child related education/training, children demonstrated greater task persistence and were less frequently found to be uninvolved in tasks and activities (Collins, 1983).

To reiterate, after reviewing the literature carefully, Soar (1983) maintains that process measures, especially teacher performance are central to quality education and that the use of process-product relationships is a productive area of future research. Process-product research is advocated using measures of classroom behavior in conjunction with pupil outcomes.

Rosenshine and Furst's contribution to teacher behavior research

Rosenshine began studying the relationship between teacher traits, behaviors, and student achievement while a graduate student at the University of Illinois. He and Furst (1973) eventually developed a model for studying teaching in natural settings which consisted of: (a) developing procedures for quantitative description; (b) correlating descriptive variables to measures of student growth; and (c) performing experimental research to test the validity of the descriptive variables in a more controlled situation. Rosenshine and Furst (1973) refer to their model as the descriptive-correlational-experimental model. In summarizing the results of 50 studies correlating teacher behaviors with student achievement, Rosenshine and Furst list nine teacher behaviors which show a relationship to measures of student achievement: Clality, Flexibility, Enthusiasm, Task

orientation and/or Business-like behavior, Criticism (negatively correlated), Use of student ideas, Opportunity to learn, Structuring statements, and Variety of simple factual and higher level questioning (Rosenshine & Furst, 1973).

A scholarly critique of the conclusions of Rosenshine and Furst (1973) based on the 50 correlation studies written by Heath and Nielson (1974) delineates a number of methodological problems. Heath and Nielson (1974) report that the teaching variables described by Rosenshine and Furst (1973) could not be found in most cases and that roughly one-third of the operational definitions used by Rosenshine and Furst did not correspond at all to the variables cited. Heath and Nielson (1974) conclude that the effects of teaching techniques on student behavior in the studies reviewed by Rosenshine and Furst (1973) is inherently trivial.

Reviewing the work of Rosenshine and Furst, Travers (1978) concluded that one of Rosenshine's important contributions to the study of teaching effectiveness was his perspicacity to assess both specific behavior and broad classes of behavior. Travers notes that there are a number of different ways a teacher can manifest "Business-like" behavior and the techniques used may be entirely different for each of ten teachers (Travers, 1978).

When Rosenshine and Furst (1973) found that their more broadly defined, higher inference measures of teacher behavior were more likely to be correlated with student achievement, they began to question the utility of identifying specific teacher behaviors such

as teacher talk, number of higher order questions, clarity of presentation, and so on, which were the focus of earlier research. Rosenshine (1978) concludes that the attempt to identify teacher behavior with student achievement gain has not been particularly productive.

Rosenshine's (1980) contribution to the six-year California Commission for Teacher Preparation and Licensing Study, known as the Beginning Teacher Evaluation Study (BTES), reflects this shift in his thinking towards an increased focus on student variables. Rosenshine (1978) summarizes the following research trends in the area of teacher effectiveness:

1. Increased focus on student variables, especially on opportunity to learn and student attention to relevant academic activity.

2. Research results which collectively support a model of direct instruction.

3. Increased information on the value of time spent doing seatwork with implications for the role of the teacher.

Research on preschool teacher behavior

In Chapter 15 of the Handbook of Research on Teaching, Sears and Dowley (1963) review research on teaching behavior in nursery school settings. Sears and Dowley (1963) group the research under the following major headings: Warmth and Nurturance; Dominative and Integrative Behavior; Active Guidance of Individual Children; Teacher Control and Restraint of Aggression; and, Teacher Behavior

as a Source of Frustration for Children. They include a separate section on teaching materials, environment, and the nursery school teacher's personality and characteristics.

Sears and Dowley (1963) conclude that warm and nurturant behavior of nursery school teachers affects children's performance on concept formation, memory, maze performance tasks, and imitation of adults' irrelevant behavior. Their review of the research on dominative and integrative behavior of preschool teachers supports the hypothesis that adult domination creates more resistance in children. Children exhibited more nonconformist behavior in the classroom with a dominating teacher. However, the results of these studies were confounded by the variation of teacher behavior toward individual children and the vastly different number of contacts with each child. The ratio of dominative to integrative contacts of teachers remained stable from one year to the next. The teacher labeled as dominating continued to be dominating from year to year. However, children's behavior was found to be not at all consistent from one year to the next (Sears & Dowley, 1963)

Sears and Dowley's (1963) assessment of the amount of guidance teachers offer to individual children rests exclusively on one naturalistic experiment in which teacher contacts were limited in one nursery school group and were warm and frequent in a matched nursery school group. The children with the warm, actively involved teachers were observed less often rejecting, ignoring, physically abusing, threatening, and were less restrictive generally toward

their peers. Testing after eight months in the program revealed that the group with actively involved teachers was more constructive, ascendent, participatory, more apt to demonstrate leadership qualities, and less likely to engage in destructive behavior.

Sears and Dowley (1963) conclude on the basis of findings of researchers who studied control and restraint of aggression that: (a) Direct teacher intervention causes "temporary" decline in fighting. (b) Presence of a permissive adult appears to increase incidents of aggressive behavior. (c) Modeled adult male aggressive behavior is imitated by children. (d) Adult nonaggressive modeling dramatically subdues the behavior of children.

Young children were purposely frustrated in order to assess the affect of adult or environmental frustration in experimental studies reviewed by Sears and Dowley (1963). Cumulative research results indicate that when frustrated by either an adult or something else in their environment (e.g., unobtainable attractive toy) both regression and aggression are demonstrated in the child's overt behavior. Frustration induced by an adult may be delayed and transferred to other less threatening targets. When a child's "good friend" is the victum of experimental frustration, she reacts with aggression toward the provoking adult (Sears & Dowley, 1963).

In a more recent review, Phyfe-Perkins (1981) discusses direct and indirect effects of preschool teacher behavior. Phyfe-Perkins (1981) concludes that effective preschool teachers (a) are encouraging; (b) use positive types of instruction; (c) are involved with children's

activities (as opposed to directing children's activity; and, (d) are child-centered in approach. Phyfe-Perkins (1981) cites twenty-two studies to document these four effective preschool teacher behaviors. Eleven of these studies (half) were written before 1950, overlapping somewhat with the Sears and Dowley (1963) review. The more recent studies cited by Phyfe-Perkins (1981) lend support to the findings of the earlier research.

Conclusion

Ideological views about teaching develop prior to scientific knowledge. The idea that child caregivers should be warm, encouraging children with positive types of instruction, gained imeptus from the psychoanalytic paradigm. In the first stage of his eight-stage theory of psychosocial development, Erikson (1963) describes the role of the adult in providing consistent, sensitive care to ensure proper development of basic trust in the infant. Already committed to the idea that warmth and nurturance and other "positive" teacher attributes are important, researchers then set out to prove it. Successful preschool teachers would probably agree that there are times when the expression of warmth and nurturance is important. They also understand that other situations may require distancing themselves, using "cold" logic, or even ignoring a child. Instances which require warm and nurturing teacher behavior are usually situation-specific and child-specific which makes it difficult to generalize using the class as the unit of analysis and summarizing across studies.

Sears and Dowley (1963) conclude on the basis of research reviewed on dominative vs. integrative teacher behavior that integrative behavior is preferable. Phyfe-Perkins (1981) concurs that effective preschool teachers involve themselves with a child's activities as opposed to directing or dominating children's activities. Democratic ideology has obvious deep roots in the history of the U.S. and more explicitly for education in the theories of John Dewey. When a researcher observes a smoothly operating preschool classroom, the teacher is likely to be involved in the activities with children. However, the astute teacher knows when to step back and observe and when not to interfere and interrupt a child's activity. Effective preschool teachers direct activity in subtle ways which may not be immediately obvious to the researcher collecting behavioral data.

Brophy and Good (1974) offer several cogent criticisms of teacher behavior research. They point out: (a) that teacher behaviors which are appropriate in one context, may be totally inappropriate in another classroom context; (b) that over-simplified and over-generalized statements about teaching behaviors are not helpful and may be harmful; and, (c) that unless accompanied by enough information to judge when a behavior is appropriate, teacher behavior research is useless to practitioners.

Doyle (1977) points out advantages of ecological research for interpreting classroom conditions which enhance student learning. He organizes teacher effectiveness research into the following paradigms: (a) the process-product paradigm which includes studies investigating

the relationship between teacher behavior and student learning outcomes; (b) the mediating process paradigm which recognizes the influence of mediating activities of students in determining what is processed and remembered; and, (c) the classroom ecology paradigm. Doyle speculates that the ecological paradigm may change the type of research question addressed in teacher behavior research. Instead of considering the importance of particular teacher behaviors or student behaviors, many contextual variables of classroom learning settings are considered. The ecological approach may be more useful to teachers in designing classrooms and tasks which enhance student learning (Doyle, 1977). In their classic work on teacher behavior research, Dunkin and Biddle agree that the view of the classroom as a social system is a fruitful area of research and that "Educators would do well to bear this in mind when interpreting the findings from more traditional studies that have considered teaching to be under the immediate control of the teacher alone" (Dunkin & Biddle, 1974, p. 392).

The Development and Application of Task Involvement as a Behavior Variable

Early studies of off-task behavior

Henry Morrison (1957) published The Practice of Teaching in Secondary School in 1926. In this book, Morrison defines control techniques for promoting student attention as well as a procedure for measuring student attention. The Morrison procedure simply involves

counting the number of students who are obviously inattentive once every minute. The state of attention was assumed when "eyes, physical posture, activities, leave the observer in no doubt" (Morrison, 1957, p. 124).

On-task behavior and teacher ability

One of Morrison's students, William French, correlated student attention with teacher ability ratings (Jackson, 1968). French and two other observers rated twenty-six fourth grade through junior high school teachers on teaching ability and observed the percentage of student attention in these classrooms. An impressive correlation coefficient of .82 was found between teacher ability ratings and Morrison's measures of group attention (Jackson, 1968). While this and other evidence (Blume, 1929; Gray, 1929) began to point to the value of using group attention scores to assess teacher ability, other researchers (Barr, 1929; Washburne, Vogel, & Gray, 1926) were more cautious about using this approach in teacher evaluation. Morrison himself viewed attention scores as being useful mainly for diagnostic and remedial purposes (Jackson, 1968).

Shifting paradigms in on-task behavior research

In the late 1930s, interest in researching student attention began to wane (Jackson, 1968). The validity of attention scores was challenged by Shannon (1942) who measured student attention of 100 seventh and eighth graders while teachers read an article on parachute

jumping. In his parachute study, Shannon found that students who were coded as inattentive were able to recall information presented during their periods of observed inattention as accurately as material presented when they were presumed to be attentive. However, Jackson (1968) does not attribute the diminishing interest in the study of student attention to researchers like Shannon who began to challenge the validity of Morrison's attention score measure. More influential, Jackson (1968) suggests, was the changing political and psychological scene which began to emphasize democratic teaching practice and Freudian psychology. "Rather than asking whether or not Johnny looks alert, the researcher now wanted to know; 'What is Johnny really thinking about as he sits in class?'" (Jackson, 1968, p. 97). In order to investigate what students were really thinking about as they sat in class, Bloom and his graduate students tape recorded lectures and discussions in undergraduate college courses. Within a few days, the tapes were played back to students who were then asked to make "simulated recall" of what they were thinking about during this time. In the three lecture settings, 65 per cent of the thoughts reported were topic related. In the 29 discussions recorded, 55 percent of the thoughts reported were related to the topic (Jackson, 1968).

Conceptual models of time-on-task

Inequality of educational opportunity came into focus in the late 1960s. The Coleman report (1966) revealed that students in less advantaged schools and communities in the United States attained in

12 years what students in more advantaged schools and communities had attained in about eight years (Bloom, 1974). The amount of time students spent actively engaged in learning and the amount of time needed to reach a criterion level of achievement was of interest to Carroll, Bloom, Wiley and Harnischfeger and a group of researchers at the Far West Laboratory.

The Carroll model. Carroll (1963) distinguished between elapsed time and the amount of time a student was actually attending to or trying to learn. He identified five factors associated with the amount of time needed for a student to learn:

1. Aptitude--the amount of time an individual needs to learn a given task under optimal instructional conditions.

2. Ability--the ability to understand instruction.

3. Perseverence--the amount of time the individual is willing to engage actively in learning.

4. Opportunity to learn--the time allowed for learning.

5. Quality of instruction--the degree to which instruction is presented so as not to require additional time for mastery beyond that required by the aptitude of the learner.

Carroll's (1963) model of learning incorporating time necessary to attain a certain level of proficiency and time spent engaged in the learning task is represented by the formula:

$$\text{Degree of Learning} = f\left(\frac{\text{time actually spent}}{\text{time needed}}\right)$$

Carroll acknowledged that time needed by students to reach a criterion level of achievement would vary among students, an idea which contributed to the development of the concept of mastery learning. Carroll's model, differentiating between elapsed time and time spent actively engaged in learning is also cited as a major influence in the use of time-on-task as a behavior variable (Bloom, 1974).

The Bloom model. Bloom studied the variation among states in terms of mean learning achievement at the end of 12 years of schooling (Bloom, 1956; Bloom & Statler, 1957). One standard deviation difference was found between students in the highest scoring state and students in the lowest scoring state (Bloom, 1974). Bloom reasoned that some students need extra time to attain the same level of achievement of their more advanced peers. He proposed that if given extra time and quality instruction, the lower scoring students could obtain a criterion level of achievement within the same calendar year.

Building on the Carroll model, Bloom (1976) proposed a model of school learning based on the amount of time a student is actively engaged in quality instruction. In the Bloom model of school learning, time-on-task is affected by three main factors: (a) previous learning and motivation; (b) interest; and, (c) the degree to which instruction is appropriate to the needs of the student. Quality of instruction involves four major elements:

1. Cues given to the learner concerning what must be learned and how to execute the learning process.

2. Reinforcement of the learning process.

3. Active participation by the student in the learning situation.

4. Feedback to the learner with specific information on progress and the opportunity to engage in additional corrective procedures.

The Wiley/Harnischfeger model. The Wiley/Harnischfeger Model emerged from Wiley's reanalysis of data from the Coleman report (1966) and is considered to be an influential theoretical precursor of the Beginning Teacher Evaluation Study (Borg, 1980). Wiley and Harnischfeger (1974) elaborated the theoretical models of Carroll and Bloom into a more detailed analysis of instructional quality. Time is still the key organizing concept in the Wiley/Harnischfeger model as it is in the Bloom and Carroll models. However, the Wiley/Harnischfeger model includes a broader array of variables which influence active learning time such as instructional quality, teacher characteristics, pupil characteristics and the nature of the learning setting. The capability of the teacher is assessed in terms of: (a) planning ability and effort; (b) implementing learning activities; (c) motivating students and keeping them actively involved; and, (d) communicating clearly and usefully with students.

In his reanalysis of the Coleman data, Wiley predicted that increasing the number of days in the school year would substantially increase student achievement. But when these data were again

reanalyzed by Karweit (1976), the impressive relationship predicted by Wiley was not found. Karweit found a small positive relationship between quantity of schooling and student achievement (Borg, 1980). Borg (1980) points out that the amount of time allocated to specific subject matter cannot be expected to be as powerful a variable as the amount of time the student is actually engaged which may explain why some researchers have failed to find significant relationships between time and student achievement.

The Academic Learning Time model. Academic Learning Time (ALT) is defined as the amount of time a student spends engaged with academically relevant material with a moderate level of difficulty. The ALT model evolved from the California Commission on Teacher Preparation and Licensing Project which is known as the Beginning Teacher Evaluation Study (BTES). This six-year study investigated ALT in mathematics and reading classes at the elementary level.

The concept of ALT was developed by Berliner (1976) and the staff at the Far West Laboratory based on the earlier work of Carroll (1963), Bloom (1973, 1974, 1976), and Wiley and Harnischfeger (1974). Borg (1980) examines the ALT model in the context of its theoretical predecessors and states that a distinct advantage of the ALT model is that its components are more concrete and quantifiable. Another major advantage of the ALT model, Borg suggests, is the fact that it has been empirically tested in the large scale BTES study. In the BTES study, Fisher, Berliner, Filby, Marliave, Cahen, Dishaw and Moore (1978) found a high correlation with achievement when the

student was engaged in task related material over time. The results of the BTES study are discussed in more detail in the following section "Time-on-task and student achievement."

The ALT model rests on several assumptions: (a) The teacher has a direct effect on student time-on-task. (b) Time-on-task is related to student achievement. (c) There is a substantial difference between the amount of time students are exposed to learning and the amount of time they are actively engaged in learning. (d) Engaged time is qualitatively the same for all students. (e) Quantity of schooling varies across the following dimensions: day, year, teacher allocation of time, appropriate instruction, student interest/effort, student ability, and opportunity to learn (Romberg, 1980).

Romberg also suggests some limitations of the ALT model in terms of theory, framework and operational details. Theoretically, the ALT model is tied to a deterministic conception of society exemplified by the direct causal relationship assumed to exist between teacher role and student engagement. Romberg considers the most serious limitations at the framework level to be the omission of quality of instruction in the ALT model, failure to consider instructural timing, and the lack of any assessment of student motivation or peer influence on student learning (Romberg, 1980). The operational limitations are not specified.

Time-on-task and student achievement

Borg (1980) reviewed studies investigating the relationship

between engaged time and achievement and concluded that cumulative research evidence over the past 36 years shows consistent positive relationships between time-on-task and achievement.

In another research review, Bloom (1976) reported results of studies which focused on the relationship between achievement and task involvement as well as other student variables. In Bloom's (1976) review, the relationship between achievement and on-task behavior was examined by separating studies into those which used the class as the unit of analysis and studies in which individual students were the unit of analysis. Bloom (1976) reviewed four studies of on-task behavior using the class as the unit of analysis (Belgard, Rosenshine, & Gage, 1968; Chall & Feldman, 1966; Morsh, 1956; Soar, 1966).

In the Morsh (1956) study of 120 aircraft mechanic classes, inattentive behavior correlated negatively with final achievement gain (-.58). In the Chall and Feldman (1966) study of 12 classes of disadvantaged first graders, participation correlated positively with test results, ranging from .19 on the vocabulary subtest of the Stanford Achievement Test to .51 on the Gilmore Roal Reading Test. Soar's (1966) 55 classes of third to sixth grade children showed a positive correlation between pupil interest, attention, and achievement gain ranging from .06 to .30 on various subtests of the Iowa Test of Basic Skills. In the Belgard, Rosenshine, and Gage (1968) study a positive correlation of .41 is reported between final achievement and task oriented behavior for 43 classes of high school

seniors.

The other nine studies reviewed by Bloom (1976) used the student as the unit of analysis (Anderson, 1973; Attwell, Orpet, & Meyers, 1967; Bloom, 1974; Edminston & Rhoades, 1959; Krauskoff, 1963; Lahaderne, 1967; Siegel, Siegel, Capretta, Jones, & Berkowitz, 1963; Sjogren, 1967; Turnure & Samuels, 1972). Two studies correlated final achievement with on-task behavior (Edminston & Rhoades, 1959; Lahaderne, 1967). Final achievement test scores correlated positively with on-task behavior, ranging from a .37 correlation with a language subtest score on the Standard Achievement Test (Intermediate II) for Lahaderne's 124 sixth grade students to a high correlation of .58 with the California Achievement Test Composite score for Edminston and Rhoades' (1959) 94 high school seniors.

Achievement gain was positive correlated with on-task behavior in all seven of the other studies, ranging from a .26 correlation (Attwell, et al., 1967) in a fifth grade follow-up study of 57 kindergarten attention ratings to .87 in Bloom's 1954 study of 45 college freshmen (Bloom, 1976).

The Attwell, et al. study is the only study of on-task behavior reviewed by Bloom (1976) involving children as young as kindergarten age. Attwell, et al. (1967) explored the use of kindergarten behavior ratings to predict fifth grade academic achievement. Immediately after administration of the Pacific Test Battery, each of 100 randomly

selected Los Angeles kindergartners was rated on the following ten behaviors observed during testing: Amount of motor activity; Performance rate; Manual dexterity; Amount of speech; Attention; Anxiety; Self confidence; Effort displayed; Cooperation given to examiner; and, Interest. Attention was defined as "the ability to put forth a mental effort and to concentrate on the task at hand" (Attwell, et al., 1967, p. 45).

Five years later these behavioral ratings were correlated with fifth grade scores on the California Achievement Test. While 45 per cent of the correlations were significant beyond the .01 level, the kindergarten "Attention" rating was the only behavior rating which predicted each of the six areas and the total scores of the California Achievement Test. The Attention behavior rating coded during kindergarten testing was found to be particularly predictive of reading ability ($p < .01$) and vocabulary ($p < .011$).

It is noteworthy that all of the studies reviewed by Bloom (1976) show a positive correlation between on-task behavior and achievement or a negative relationship between off-task behavior and achievement. Recent studies not included in the Bloom (1976) review continue to report a positive association between time-on-task and student achievement.

Brophy (1974) reported that student learning gains were affected by the amount of time students were on-task and the time available for learning. Stallings (1975) noted higher reading and mathematics scores for children in Follow Through classrooms who spent more time

participating in reading and mathematics activities. In a more recent study, Stallings (1980) assessed student reading gain in 87 high school remedial classes and found the amount of time allocated to specific reading activities to significantly affect reading improvement. Good and Beckerman (1978) observed sixth-grade students in two schools where . . . "high achievers were coded as being definitely involved eight percent more frequently than low achievers" (Good & Beckerman, 1978, p. 197).

Everston, Emmer, and Clements (1981) report a partial correlation of .20 between time-on-task and English test scores and .34 between time-on-task and mathematics test scores in 150 junior high school classes. Karweit and Slavin (1981) coded off-task behavior during mathematics instruction in a pretest-observation-postest design experiment in six combined second and third grade classrooms and in twelve combined fourth and fifth grade classrooms. Karweit and Slavin (1981) found that the number of engaged minutes was significant in predicting mathematics test scores for the combined second and third graders but not in the mixed fourth and fifth grade classrooms.

Heinicke (1977) observed on-task behavior of two girls entering preschool. Performance differences on standardized tests at age five showed an IQ difference of 39 points favoring the girl who was more task involved at age three. However, these results are confounded by the fact that the child who had difficulty staying on-task at age three also had difficulty staying on-task during the intelligence test at age five.

A study which utilized the Schaefer-Aaronson Classroom Behavior instrument involved 235 children attending public kindergarten in North Carolina (Landsberger, Kingsley, & Pratto, 1976). Scores on Task Involvement, Extraversion, and Social Behavior were gathered at the beginning and end of first grade. At the end of first grade, achievement was measured on five subtests of the Stanford Achievement Test. Task orientation was found to be correlated with reading achievement ($r = .46$). The authors conclude that of the three variables investigated (Task Involvement, Extraversion, and Social Behavior), Task Involvement showed the strongest and most consistent relationship to achievement (Landsberger, et al., 1976).

The six-year Beginning Teacher Evaluation Study (BTES) was an in-depth examination of the relationship of student engaged time and teacher allocated time to student learning. It involved four separate samples of students and teachers in a four-part research effort known as Phase II, Phase III-A, Phase III-A Continuation, and Phase III-B (Fisher, Berliner, Filby, Marliave, Cahaen, & Dishaw, 1981). During the BTES study, a measure of student learning--Academic Learning Time--was developed. Academic Learning Time (ALT) is defined as the amount of time students spend engaged in an academic task with a high degree of success (Fisher, et al., 1981). One hundred thirty-nine students in 25 second grade classrooms and 122 students in 21 fifth grade classrooms comprised the final sample. Fisher, Berliner, Filby, Marliave, Cahen, and Dishaw (1981) summarized the major findings of the relationship between ALT and student achievement as follows:

1. The amount of time that teachers allocate to instruction in a particular curriculum content area is positively associated with student learning in that content area.

2. The proportion of allocated time that students are engaged is positively associated with learning.

3. The proportion of time that reading or mathematics tasks are performed with high success is positively associated with student learning.

4. The proportion of time that reading or mathematics tasks are performed with low success is negatively associated with student learning.

5. Increases in Academic Learning Time are not associated with more negative attitudes toward mathematics, reading, or school.

Rosenshine (1980) cautions that the results of the BTES research should be considered within the limitations of the study. The study was confined to reading, language arts, and mathematics instruction for second and fourth graders who were within the average range (25th to 65th percentile) on pretests (Rosenshine, 1980). However, Borg (1980) points out that detailed information collected on specific content areas during 13 weeks of observation provides a robust data base.

Karweit (1983) takes a critical look at the BTES research and seven other studies which link time and student learning. After initial student ability is partialed out, Karweit reports that time-on-task is not as influential in promoting student achievement as

previously claimed. Although attention measures have been positively correlated with student achievement in the range of .25 to .58, Karweit (1983) calculates that after controlling for initial ability, a partial correlation range of .09 to -.43 would be found. She calls attention to the sources of variation which affect student on-task behavior across days, across students, and across classrooms. Karweit and Slavin (1981, 1982) point out that differences in definitions of time-on-task and in observation schedules and procedures also affect study results. Methodological decisions such as whether momentary off-task behavior is coded, differing sampling techniques, number of days of observation, number of students observed, all influence study outcomes (Karweit & Slavin, 1982).

Environmental influences on task involvement

Adult role. Bell and Davidson (1976) assessed nine determinants of pupil on-task performance, and 25 behaviors of 23 teachers in grades four through six at four elementary schools. Significant partial correlations were reported between on-task performance and pupil achievement in only three of the 23 classrooms. These researchers concluded that the most important variable in the classroom may be the teacher behavior which results in pupil on-task performance.

Stallings (1975) observed four first-grade and four third-grade classrooms in 36 locations across the United States for the purpose of evaluating Project Follow Through, a federally funded program

established in 1967 to extend Head Start into the elementary school. Two research questions were paramount in the Stalling's study: (a) How consistantly are specific educational models of Follow Through reflected in observed teaching practices? and (b) How are teaching practices related to child outcomes?

Stalling's second research question relates directly to the present investigation. Teacher role, group size and task persistence are variables of similar interest. Stalling's (1975) comprehensive Classroom Observation Instrument included 602 categories for describing teacher and child behaviors. Observations were collected for two days on teacher behavior and for one day on the behavior of four randomly selected children from each classroom. Adult role included four categories: (a) Not involved, (b) Observing, (c) Participating, and (d) Directing. Child group size was a tripartite division: One to two children, Small Group, and Large Group. Task persistence was coded when a child was engaged in self-instruction over a span of several minutes.

Highly positive relationships were found between task persistence and the use of textbooks and workbooks. There was an increase in task persistence when the teacher instructed the child on a one-to-one basis but in the third grade sample when teachers were coded as interacting on a one-to-one basis there was no increase in task persistence.

Reporting results from the BTES study, Rosenshine (1981) found that second and fifth-grade students demonstrated that Working Alone

was the dominant pattern during reading and mathematics. Rosenshine and his colleagues found an 84 per cent student engagement rate in teacher-led reading and math groups as opposed to 70 per cent student engagement for reading and math seatwork. Teachers whose students were engaged in reading and math a high proportion of the time also allocated more time for reading and math. Substantive interaction--explanations, questions, answers, feedback--was highly correlated (.45) with overall engagement.

Case studies of two 3-year olds entering day care were examined by Heinicke (1977) in an attempt to show that past and present relationships with salient adults are associated with task orientation. He speculates that differences in the nurturing behavior of primary caregivers were responsible for differences in on-task behavior at age three and IQ test scores at age five.

Farnham-Diggory and Ramsey (1971) found that irrelevant adult comments produced a negative effect on the play persistence of kindergarten children. Krantz and Scarth (1979) compared the effects of different types of adult assistance on the task persistence of 39 preschool children. Prompting and Reinforcement from the adult caretakers were significantly correlated with the preschoolers' task persistence. Adult proximity and verbal reinforcement, interestingly, showed no significant effect on task persistence.

Setting effects. Stallings (1980) urged researchers to move beyond a simplistic notion of task persistence and Academic Learning Time to examine how students' time is allocated across activities.

As part of the Oxford Preschool Research Group which studied preschool education in Britain, Sylva, Roy, and Painter (1980) compared time distribution across several common preschool activities. One hundred twenty randomly selected preschoolers in Miami, Florida were compared with the same number of age-matched, sex-matched subjects in Oxford, England. Differences between American and British centers were found. There was a more even distribution of time across several common preschool activities such as Art, Gross Motor Play, and Adult-led Group Activity in the British sample. In American preschools, children spent a disproportionate amount of time (25 per cent) in Adult-led Group Activity and Watching. The types of activities in which children were engaged differed along dimensions of structure and academic content with Oxford children spending more time involved in loosely structured activity and Miami children spending more time engaged in Three Rs Activity.

Types of activity which were judged to challenge children intellectually were similar, i.e., Three Rs, Music, Art, and Construction. However, the Oxford children spent 47 per cent of their time engaged in these more challenging activities while the Miami children spent only 29 per cent of the time engaged in activities judged to be intellectually stimulating.

Sylva, Roy and Painter (1980) were also interested in finding out if sex, age, time of day, type of center, grouping of children, contact with an adult and/or type of activity were good predictors of Level of Challenge. A regression analysis showed that the

activity in which the child was engaged was by far the most powerful predictor of cognitive challenge and that preschool activities are markedly different (0.7 on a 0-1 scale) in their effect on Level of Challenge (Sylva, et al., 1980).

Setting effects on children's preschool behavior has been studied by several other groups of researchers (Falsey & Ramsey, 1972; Kounin & Doyle, 1975; Kounin & Gump, 1974; Morrison & Oxford, 1978; Oxford, Morrison & McKinney, 1979). Falsey and Ramsey (1972) used a time sampling technique to gather data during small group activities and selected free choice activities in two Demonstration and Research Centers for Early Education (DARCEE). Task orientation was defined as "verbalization, vocalization, gesture, or physical act pertaining to the task in which the target child is participating." Non-task behavior was defined as "verbalization, vocalization, gesture, or physical act not related to the task in which the target child is participating." The target child was observed for a 10-second interval (epoch) and then coded for 10 seconds, for 10 successive epochs.

A series of factor analyses of variance with repeated measures was performed on all factors. There was no significant setting effect for task orientation, i.e., children were on-task and off-task proportionally about the same in the free choice activity as they were in the teacher directed small group. A decrease in teacher direction in selected free choice was not accompanied by a decrease in percentage of task orientation. Child to child interaction in selected free choice activity was more task oriented, made greater

use of props, and showed an increase in verbal interaction (Falsey & Ramsey, 1972).

Kounin and Gump (1974) videotaped thirty-six preschool teachers and rated them on continuity, insulation, and intrusiveness using task involvement as the criterion variable. The most successful lessons (high task involvement) were those in which there was high continuity such as individual construction projects. The least successful in terms of task involvement were those with high intrusiveness (gross motor and loud musical instruments). Using the same videotapes, Kounin and Doyle (1975) investigated task involvement within the same lesson format. They found that measured degrees of continuity within lesson types existed and contributed to differences in task involvement. Kounin and Doyle (1975) also concluded that teacher techniques of maintaining lesson continuity varies depending upon the lesson format.

Based on this earlier work on the theory of signal continuity, Oxford, Morrison and McKinney (1979) hypothesized that off-task behavior would be: (a) more frequent during independent seatwork than during continuous central signal emission; (b) more frequent during whole-class recitation than in independent seatwork; and, (c) more frequent during whole-class recitation than during continuous central signal emission. Twenty kindergarten children from two different schools were randomly selected and observed using a time-sampling technique. The kindergarten children were found to be more distractible, passive, and non-constructively involved in whole-class

recitation than in either independent seatwork or continuous central signal emission, adding support to the importance of signal continuity for maintaining on-task behavior (Oxford, Morrison, & McKinney, 1979).

Summary of Literature Review

Literature was reviewed in four major sections: (a) early observational studies of young children's attending behavior; (b) conceptual shifts in the study of attention; (c) a review of teacher behavior research; and (d) the development and application of task involvement as a behavior variable. The first section was intentionally limited to a few representative studies conducted in the early 1930s illustrating early types of issues and research questions addressed. In the 1920s and 1930s, researchers investigated the length of young children's attention span and possible relationships between attention and several independent variables: age, sex, time of day, toy, length of occupation, and IQ.

Among other variables, Schacter (1933a; 1933b) was interested in finding out if length of attention span varied with the complexity of an activity. A positive relationship was found to exist between degree of activity complexity and attention span. There was no correlation between IQ and attention span. Both complexity of activity and the relationship of IQ to attention are issues raised in following chapters of the present study.

Psychological theories of attention were reviewed because of their direct connection with on-task behavior. In 1897, Wundt studied attention by listening to self-reports of his subjects' attending behavior. Hallshan, Lloyd, Kosiewicz, Kauffman, and Graves (1979) taught a seven-year old boy to monitor his own on- and off-task behavior. Upon hearing a tape-recorded tone, the boy was instructed to record his task involvement. Based on this research and subsequent studies, Kneedler and Hallahan (1981) conclude that self-monitoring is a viable technique for increasing on-task behavior for children with learning disabilities who lack appropriate task approach skills.

Teachers of children with an Attention Deficit Disorder are probably aware of the filter theory of attention proposed by Broadbent (1958). Broadbent postulated that a filter is imposed to limit imput when an information overload occurs. However, novel stimuli and information inputs relevant to the task at hand have a better chance of passing this filter (Broadbent, 1958). If this theory is correct, it is important to control the amount of novel environmental stimuli, particularly for children who have a difficult time staying on task.

Major reviews of the vast amount of teacher behavior research were considered in the next section. When disappointingly little relationship was found to exist between specific teacher behavior and student performance, Rosenshine (1978) redirected his research efforts toward the investigation of student variables--opportunity to learn and time-on-task. Preschool teacher behavior research was reviewed by Sears and Dowley (1963) and Phyfe-Perkins (1981). These reviews contend

that the teacher is the most important factor in the preschool environment. The relationship of teacher behavior to on-task behavior of preschool children in an integrated handicapped, nonhandicapped preschool will be discussed in Chapters IV and V.

The development of task involvement as a behavior variable began in the late 1920s when Morrison (1956) devised a technique for coding off-task behavior in secondary schools. In a major review of time-on-task research, Jackson (1968) points out how political and psychological changes influenced the kinds of questions addressed in time-on-task research. In a more recent publication, Jackson (1977) supports renewed interest in the study of attending behavior but expresses misgivings concerning the methodological integrity of this research.

The Coleman report (1966) jolted educators by pointing out the difference in achievement of children from less advantaged schools and communities. Building on the Carroll Model, Bloom developed the concept of mastery learning which takes into account the amount of time students need to reach a criterion level of achievement. Wiley and Harnischfeger (1974, 1976) expanded the theoretical models of Carroll and Bloom to include a broad array of instructional quality variables.

The six-year Beginning Teacher Evaluation Study (BTES), sponsored by the California Commission on Teacher Preparation and Licensing Project, developed the concept of Academic Learning Time (ALT). ALT, defined as the amount of time a student spends with

academically relevant material, is based on the earlier work of Carroll (1963), Bloom (1973, 1974, 1976), and Wiley and Harnischfeger (1974). A high correlation was found to exist between ALT and student achievement in the BTES study.

The National Commission on Excellence in Education created in 1981 to investigate the quality of education in America concluded in their 1983 report, A Nation at Risk, that: (a) American students spend much less time on school work than students in other nations. (b) Time spent in the classroom and on homework is often used ineffectively. (c) Schools are not helping students develop study skills and the motivation necessary for efficient use of time.

One of the papers commissioned by this national committee was authored by Karweit (1983). Karweit's (1983) review of time-on-task research concludes that after initial ability is partialed out, there is little correlation between time-on-task and student achievement. Karweit's work will be discussed in greater detail in Chapters IV and V.

Task involvement research reviewed in the present study falls into two general categories: (a) time-on-task and student achievement; and (b) environmental influences on task involvement. The large number of studies investigating time-on-task and student achievement have generally found a strong positive correlation to exist between on-task behavior and achievement. The investigation of environmental variables thought to influence time-on-task have included: teacher behavior, child group size, type of activity, nurturant caregivers, and

continuity of signal emission. It would be premature to make any general conclusions based on the small number of studies investigating environmental influences for time-on-task. However, this may prove to be a productive area of future research.

CHAPTER III

METHODOLOGY

Introduction

Environmental psychologists, personality theorists, and social psychologists have all recognized the impact of environmental variables on behavior (Barker, 1968; Moos, 1973; Craik, 1976; Mischel, 1968, 1973; Bandura, 1969). Preschool environments typically contain a variety of behavior settings or learning areas which tend to elicit different types of behavior and impose behavior repertoire restrictions upon the child. For example, in the sandbox, children are often engaged in verbal interaction and cooperation. They use and combine material in imaginative ways. Whereas in a large teacher directed group activity, children are more apt to be passive, listening to a story, following directions, and respecting the physical space of other children. In order to promote their behavioral expectations of children, teachers provide a variety of props--sand toys which can be used in versatile and creative ways in the sandbox and carpet squares to define each child's physical space to promote listening behavior in a large group meeting area. These simple ecological arrangements in the behavior setting are intended to influence sociality in the sandbox and increase attentiveness of young children to a story in a large group meeting area.

The present study is designed to investigate the impact of three environmental variables on the frequency of handicapped and typical

children's task involvement: (a) the role of the teacher; (b) the size of the child group; and (c) the activity or learning area of the classroom where the behavior occured.

Observation Procedure

The observation procedure used was the Naturalistic Evaluation for Program Improvement (Day, Perkins, & Weinthaler, 1979), a formative procedure designed to gather data on the daily operation of early childhood programs and provide feedback for program improvement. Observations of children's behavior were recorded on The Behavior Checklist (Day, Perkins, & Weinthaler, 1978) which consists of 33 discrete behaviors in seven generic categories: Task Involvement, Cooperation, Autonomy, Verbal Interaction, Materials Use, Program Management, and Consideration. A copy of The Behavior Checklist is included in the appendix.

Focus on Task, the criterion variable of interest in this study, is coded when the child is clearly focused on the materials, activity, or the persons included in the task or activity for a full 30 seconds although a momentary distraction, such as retrieving a dropped crayon, is ignored. In addition to the child's behavior, the Activity/Learning Area was recorded for each behavioral observation. Prior to gathering observational data, an Activity/Area Description form was completed for each learning area of the classroom. The form documents physical aspects of the learning area such as location and available materials.

At the beginning of each year, the head teacher listed her behavioral expectations of the children, area use restrictions, and developmental goals for each area. The appendix contains twelve Activity/Area Description forms. Half of these were completed before the fall 1979 observation period; the other six were filled out prior to the fall 1980 observations. This study is limited to six areas which remained constant over the two-year data gathering period. After the behavior of the target child and the area or activity were coded, Adult Role was noted. Four general categories of adult behavior were recorded: (a) Absent, (b) Observing, (c) Participating, and (d) Directing. Size of the child group also consisted of four coding categories: (a) Alone, (b) two to five children, (c) more than five but fewer than the whole group, and (d) all of the children.

The Behavior Checklist of Child Environment Interaction was the primary research instrument. However, posttest scores from the McCarthy Scales of Children's Abilities were utilized in a secondary analysis. Principle investigator, Dr. David E. Day of the University of Massachusetts evaluated the program from 1978 to 1981. The author served as assistant evaluator for a two-year period from 1979 to 1981 which forms the data base for this research.

On-site inter-rater reliability was established between the two raters prior to each observation period. Agreement of 80% or better was consistently maintained. Children were randomly selected for observation. Approximately forty 30-second observations were made on successive days and scheduled at half hour intervals over the

morning preschool program for each target child.

Site

The integrated handicapped, nonhandicapped preschool under study was located in a rural community in western Massachusetts. It was a federally funded demonstration project housed in a primary school which enrolled approximately 200 kindergarten through third grade children.

The program was situated in two adjoining classrooms on the ground floor of the samll brick building. The ground floor location provided convenient exit and entry for nonambulatory children. The Block, Book, Large Group, and Sensorial Areas were located in the larger carpeted room near the building exit. Art and Snack Activities utilized the same space in the smaller adjoining room with the tile floor.

Subjects

During a two-week observation period in the fall of 1979, a total of 648 30-second observations was gathered of the behavior of handicapped (N = 10) and typical (N = 9) children. In the spring of 1980, 610 observations were recorded of handicapped (N = 9) and typical (N = 8) children. The following year, 680 observations were gathered in the fall from the population of handicapped (N = 9) and typical (N = 9) children in attendance. In the spring of 1981, the handicapped (N = 10) and typical (N = 9) children yielded a total of 695 observations.

The handicapped population was comprised of children with an array of special needs from mild to severe handicaps. Handicaps included Tuberous Sclerosis, Cerebral Palsy, Mental Retardation, Seizure Disorder, Developmental Delay, Icthyosis, Brain Damage due to Encephalitis and Failure to Thrive. The children's chronological age range was three years, three months. The oldest child was six years, nine months old at the end of the first program year. However, the developmental range of the children and the variation among developmental areas for the same child represents a much greater disparity than the chronological age range.

Three staff members remained in the program throughout the two-year period of this study; the two codirectors and one teacher. One teacher and one assistant teacher were replaced after the first year of this study by a head teacher and an assistant teacher. The two codirectors held M.Ed.'s in special education and teaching certification in the Montessori Method of Education. The teacher and assistant teacher who were replaced were both college graduates and were replaced by teachers with similar educational backgrounds and extensive practical experience with special needs children. Physical therapy was provided by specialists when designated by individual educational planning. Several children received speech therapy on a regular basis from a speech therapist. In addition to paid personnel, the program was able to attract well qualified student interns and volunteers.

Data Analysis

Research hypothesis 1 states that the mean per cent on-task behavior will not change significantly from the first observation period in the fall of each academic year to the second data gathering period in the spring near the end of the preschool year. The data analysis employed in the first hypothesis will be a directional one-tailed paired t-test. The type of pairing used will be self pairing, i.e., each child's Focus on Task score for the fall observation period will be compared with her Focus on Task spring score. This method of pairing each child's Time 1 mean per cent on-task behavior with her Time 2 mean per cent on-task behavior score reduces the effects of extraneous influences on subject-to-subject variability. Statistical Package for the Social Sciences (SPSS) will be used for the following computation:

$$H_1: \ \bar{X}_1 < \bar{X}_2$$

$$H_2: \ \bar{X}_3 < \bar{X}_4$$

where $\bar{X}_1$ is the mean per cent on-task behavior observed during a two week period in November 1979; $\bar{X}_2$ is the mean per cent on-task behavior observed in May 1980; $\bar{X}_3$ represents the mean per cent on-task behavior in October 1980; and $\bar{X}_4$ is the mean per cent on-task behavior observed during a two and one-half week daily observation period in May 1981. The paired differences from fall to spring of each program year is computed ($D = \bar{X}_1 - \bar{X}_2$) and ($D = \bar{X}_3 - \bar{X}_4$). The

same mean and sample variance are computed ($\bar{d}$ and $S^2_{\bar{d}}$). Next,

$$t = \frac{\bar{d} - \delta}{S_{\bar{d}}}$$

$$S_{\bar{d}} = \sqrt{\frac{S_1^2 + S_2^2 - 2 \text{ cov } (X_1, X_2}{n}}$$

where n is the number of pairs of scores and n-1 the degrees of freedom and cov (X_1, X_2) is the covariance between X_1 and X_2 and cov (X_3, X_4) would be the covariance between X_3 and X_4.

Research hypothesis 2 states that a statistically significant difference will exist in the mean per cent of observed on-task behavior between handicapped and nonhandicapped children at each of the four observation points. The second research hypothesis will be assessed using descriptive statistics. SPSS subprogram FREQUENCIES and CONDESCRIPTIVE will be utilized to obtain the mode, median, mean, standard deviation, standard error, and skewness of Focus On Task of handicapped and nonhandicapped groups for all four observation periods: fall 1979, spring 1980, fall 1980, and spring 1981. If the variability within groups is too disparate, a non-parametric test, the Mann-Whitney U Test will be used to test for this hypothesis.

Research hypothesis 3 claims that the behavior of the teacher--whether she is Absent, Observing, Participating, or Directing--will be the best predictor of task orientation of children in this integrated preschool.Chi-square tests will be performed for each observation

period to determine if a systematic relationship exists between the independent variables and Focus on Task. If a relationship of statistical significance is found between these variables, a stepwise regression will be performed with Focus on Task as the dependent variable using BMDPLR. in Addition, it is hypothesized that teachers will be observed Directing significantly more often when handicapped children are coded on-task. If variability within groups is not too disparate, a one-way ANOVA will be performed to test for significant differences between teachers' observed Directing behavior with handicapped and nonhandicapped children's Focus on Task. If mean on-task scores are too disparate, these data will be presented graphically.

Research hypothesis 4 maintains that the behavior setting or area of the classroom will be an important predictor of children's on-task behavior for both handicapped and nonhandicapped children. The stepwise multiple regression performed in the data analysis of the third thypothsis using BMDPLR will include Activity/Learning Area as one of the predictor variables for Focus on Task behavior of children so that this thypothsis will be addressed.

In addition to the four research hypotheses stated above, a secondary data analysis will be performed to determine if general cognitive test scores of the McCarthy Scales of Children's Abilities are correlated with percentage on-task behavior. May McCarthy posttest scores will be correlated with May percentages of Focus on Task for each child.

CHAPTER IV

RESULTS

Introduction

This study of the frequency of observed on-task behavior of handicapped and nonhandicapped children in an integrated preschool is based on an ecological perspective which maintains that environmental opportunities and constraints hold explanatory value for behavior (Lewin, 1944). The effects of several environmental variables on the frequency of handicapped and typical children's task involvement were investigated: The role of the teacher, the size of the child group, and the activity or learning area of the classroom where the behavior occurred were the independent variables. On-task behavior was the criterion variable.

Naturalistic data were gathered twice yearly during two-week data gathering periods from 1979 to 1981. The frequency of on-task behavior of 14 handicapped and 13 nonhandicapped children was coded on The Behavior Checklist (Day, et al., 1978). The two-week data gathering period during fall 1979 yielded a total of 640 30-second observations. A matrix of Focus on Task by Area showed children to be on-task in the six areas used in this analysis a total of 352 times. During spring 1980, 610 observations were collected with

245 cases of Focus On Task coded in the six target areas. In fall 1980, 323 cases of Focus On Task in the Art, Block, Book, Large Group, Sensorial and Snack Areas were culled from the 680 cases coded. The final observation period in spring 1981 produced 695 cases in which 354 cases of Focus On Task were specified in the six areas under study.

Hypotheses

Research hypothesis 1

The null hypothesis was posed in an attempt to rule out the possibility of a significant change in the percentage on-task behavior of all children in attendance from fall to spring of each observation year. It was postulated that the mean per cent of on-task behavior would not change significantly from the first observation period in the fall of the academic year to the second data gathering period in the spring near the end of the preschool year.

A one-tailed paired t-test comparing the percentage observed on-task behavior of each child in the fall of 1979 with her percentage on-task behavior in the spring of 1980 revealed a significant increase in on-task behavior at $p \leq .05$. During the second year of this study, percentage on-task behavior showed a positive but not a significant change from the fall of 1980 to the spring of 1981. Results of these analyses are presented in Table 1.

Table 1. Mean per cent on-task behavior, standard deviation, and one-tailed t-test probability for children in an integrated preschool.

	N	Means	Standard Deviation	One-tailed Probability
Fall 1979	17	58.59	19.85	
Spring 1980	17	70.53	11.93	.008*
Fall 1980	18	67.78	24.91	
Spring 1981	18	72.28	14.40	.198

$p \leq .05$

As shown in Table 1, fall 1979 mean per cent on-task behavior of 58.59 is approximately nine percentage points below the fall 1980 mean. One possible explanation for this difference may be the change in children and staff during the second year of this study. While six handicapped and five nonhandicapped children remained enrolled for the entire two year data gathering period, four handicapped and four nonhandicapped children observed during 1979-1980 were not in attendance the following year. These slots were filled by four handicapped and four typical children enrolled during 1980-1981. Reassignment of staff responsibility resulted in the hiring of a new head teacher for the 1980-1981 school year. One of the two co-directors who had been teaching in the classroom during 1979-1980 became a program consultant during 1980-1981. In addition, one of the three other teachers moved from the area and was replaced in 1980-1981. Although program continuity was maintained, these changes in staff and children naturally created some changes in procedures and the

physical environment. Environmental changes are documented on the Activity/Area Description forms in the appendix. Environmental variables correlated with on-task behavior of children are reported under the third hypothesis' results.

Hypothesis 2

It was hypothesized that a statistically significant difference would exist between the on-task behavior of handicapped and nonhandicapped children at each of the four observation points--fall 1979, spring 1980, fall 1980, and spring 1981. Behavioral characteristics associated with some types of handicapping conditions include a short attention span. In the preschool under study, several severely handicapped children had difficulty focusing on task. For example one child with Tuberous Sclerosis was able to focus on task only intermittently. Her behavior profile of on-task activity was well below the group mean (Day, Warner, & Logue-Blair, 1981). Percentage on-task behavior for each individual child appears in the appendix.

Because of the anticipated differences in on-task behavior statistically and the wide variation apparent in on-task behavior scores, ranging from a low of 0 for a child with severe seizure disorder to a high of 94 per cent for a four-year old boy, the children were divided into three groups: (a) nonhandicapped, (b) handicapped, and (c) severely handicapped. Table 2 presents the results of a two-tailed Mann-Whitney U Test corrected for ties.

Table 2. P scores of a two-tailed Mann-Whitney U Test comparing percentage on-task behavior of nonhandicapped, handicapped, and severely handicapped children.

	Nonhandicapped with Handicapped	Nonhandicapped with Severely Handicapped	Handicapped with Severely Handicapped
Fall 1979	.34	.005*	.019*
Spring 1980	.82	.199	.319
Fall 1980	.67	.034*	.040*
Spring 1981	.96	.166	.210

*$p \leq .05$

As shown in Table 2, there was no statistically significant difference between handicapped and nonhandicapped children's on-task behavior in general. However, in the fall of each program year there was a statistically significant difference between the on-task behavior of the most severely handicapped children and all other handicapped and nonhandicapped children. Five severely handicapped children who lacked expressive language ability fell into this category: (a) a severely retarded child with Tuberous Sclerosis; (b) a child with severe seizure disorder; (c) a deaf child who was also emotionally disturbed; (d) two children with Cerebral Palsey. Because these five young girls were considerably delayed in many developmental areas, i.e., gross motor, fine motor, language, and cognitive, the most interesting finding reported in Table 2 is the

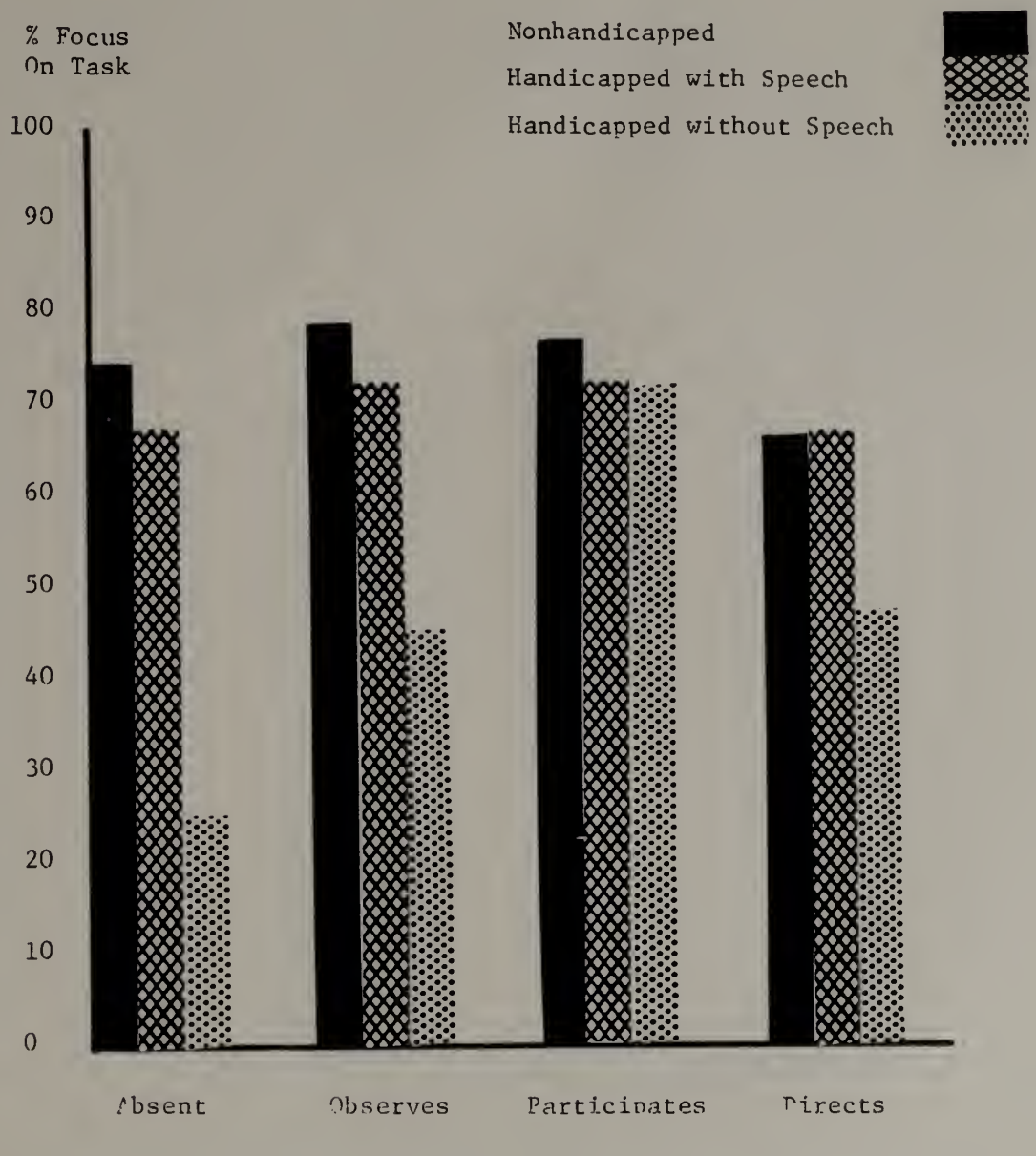
fact that there was no significant difference in on-task behavior means in the spring of 1980 and 1981.

In an attempt to find out why there were no significant differences in the spring of 1980 and 1981, the raw data were re-examined. Data were available for all four severely handicapped children enrolled in the integrated program in spring 1980. However, the number of observations were inadequate in one instance for reasons beyond the control of the research team. Only 20 data points were gathered of the behavior of the emotionally troubled deaf child. The child was observed to be task involved in 18 out of 20 (90%) of these observations gathered in only two behavior settings, viz., Sandbox and Art. This high frequency of on-task behavior score is probably not representative of this child. It inflated the group mean of the four severely handicapped children in spring 1980. More observations would have yielded a more accurate assessment of this child's task involvement. In spring 1981, three severely handicapped children were observed to be on-task 26%, 36%, and 80%. Again the 80% score resulted from only 20 observations gathered in three very structured behavior settings (One-to-one instruction as the child was proped in a specially adapted chair, Snack, and Large Group Meeting). The high frequency of observed on-task behavior was clearly not representative of this child with very involved Cerebral Palsey.

Are teachers observed Directing more often when handicapped children are observed on-task? Figure 1 on the following page shows that nonhandicapped and handicapped children with productive language are similar in this respect. When the teacher was Directing, nonhandicapped children were Focused on Task 68.1 per cent, and handicapped children with speech were Focused on Task in 68.5 per cent of these observations. However, handicapped children without productive language revealed a different pattern of on-task behavior in terms of teacher role.

When teachers were Absent, handicapped children without productive speech were Focused on Task in only 25.5 per cent of the observations. When teachers Observed, this group of children was 45.3 per cent Focused on Task. And when teachers Directed, they were 46.3 per cent Focused on Task. The severely handicapped children without speech were considerably more Focused on Task when teachers were Participating in their activities. When teachers were coded as Participating, they were 73.7 per cent Focused on Task. A direct causal relationship between the high percentage of Focus on Task for these severely handicapped children without speech and teacher Participation is unwarranted. However, it can be stated that these handicapped children were not observed Focused on Task most often when teachers were Directing their activity.

Figure 1. Bar diagram illustrating comparative percentages Focus On Task for nonhandicapped children, handicapped children with speech, and handicapped children without speech when adult is Absent, Observing, Participating and Directing averaged across all four time periods.



Hypothesis 3

It was assumed that the behavior of the teacher--whether she was Absent, Observing, Participating, or Directing--would be the best predictor of task involvement for children in the integrated preschool under study. Chi-square tests were performed for each time period to find out if a systematic relationship existed between Focus On Task, Teacher Role and Activity/Learning Area. The independent variable, Learning/Activity Area consisted of five activity areas which remained constant across all four time periods: (a) Art Area, (b) Block Area, (c) Book Area, (d) Large Group Meeting, (e) Sensorial Area, and (f) Snack Time. Results of the Chi-square tests are presented in Table 3.

Table 3. Chi-square tests of per cent Focus On Task by Teacher Role and Learning/Activity Area.

	Chi-square Value	Degrees of Freedom	Significance Level
Fall 1979	149.2	15	.0001
Spring 1980	139.9	15	.0001
Fall 1980	175.1	15	.01
Spring 1981	223.4	15	.01

Although Chi-square tests do not reveal the strength of the relationship, Table 3 shows that a relationship does exist between the

independent variables Teacher Role and Activity/Learning Area and Focus On Task.

A stepwise multiple regression analysis was employed to examine the predictive value of Teacher Role, Activity/Learning Area, and Group Size for the dependent variable Focus On Task. The results of this regression analysis are presented separately for each time period in Tables 4.1, 4.2, 4.3, and 4.4.

Table 4.1. Fall 1979 stepwise multiple regression for predictor variables Teacher Role, Learning/Activity Area, and Group Size for the criterion variable Focus On Task.

Step Number	Term Entered	df	Improvement Chi-square	Improvement p-value	Goodness of Fit Chi-square	Goodness of Fit p-value
1	Group Size	3	30.437	.000	94.951	.000
2	Area	5	30.676	.000	64.275	.015
3	Teacher Role	3	6.696	.082	57.579	.028

Table 4.2. Spring 1980 stepwise multiple regression for predictor variables Teacher Role, Learning/Activity Area, and Group Size for the criterion variable Focus On Task.

Step Number	Term Entered	df	Improvement Chi-square	Improvement p-value	Goodness of Fit Chi-square	Goodness of Fit p-value
1	Teacher Role	3	29.842	.000	86.140	.001
2	Area	5	9.843	.080	56.298	.166

Table 4.3. Fall 1980 stepwise multiple regression for predictor variables Teacher Role, Learning/Activity Area, and Group Size for the criterion variable Focus On Task.

Step Number	Term Entered	df	Improvement Chi-square	Improvement p-value	Goodness of Fit Chi-square	Goodness of Fit p-value
1	Area	5	23.048	.000	62.950	.060

Table 4.4. Spring 1981 stepwise multiple regression for predictor variables Teacher Role, Learning/Activity Area, and Group Size for the criterion variable Focus On Task.

Step Number	Term Entered	df	Improvement Chi-square	Improvement p-value	Goodness of Fit Chi-square	Goodness of Fit p-value
1	Area	5	21.036	.001	90.381	.000
2	Group Size	3	6.676	.083	83.706	.001

On the basis of the results of the stepwise multiple regression presented in Tables 4.1, 4.2, 4.3, and 4.4, hypothesis 3 was rejected. The behavior of the teacher--whether she was Absent, Observing, Participating or Directing--was not the best predictor for the on-task behavior of children in the integrated preschool under study. Teacher role was a strong predictor of children's on-task behavior in only one of the four time periods as seen in Table 4.2.

Research hypothesis 4 was supported by the results of the stepwise multiple regression presented in Tables 4.1, 4.2, 4.3 and 4.4. The behavior setting or area of the classroom was an important predictor of children's on-task behavior in this integrated preschool. During the fall 1979 observation period, Activity/Learning Area accounted for approximately 30 per cent of the variance in children's Focus On Task behavior and about 10 per cent, 23 per cent, and 21 per cent of the variance during observation periods in spring 1980, fall 1980, and spring 1981, respectively.

Test scores from the McCarthy Scales of Children's Abilities, a standardized test intended for children between the ages of 2.5 and 8.5 years, were available for all 13 nonhandicapped children and 9 handicapped children when they left the program in May 1980 or May 1981. General cognitive ability (IQ) scores from the McCarthy were correlated with percentage on-task behavior gathered at the same point in time. There was no correlation between IQ and Focus On Task for either handicapped or nonhandicapped children. The scatterplot in Figure 2 demonstrates this lack of a systematic relationship between IQ and on-task behavior.

Summary of results

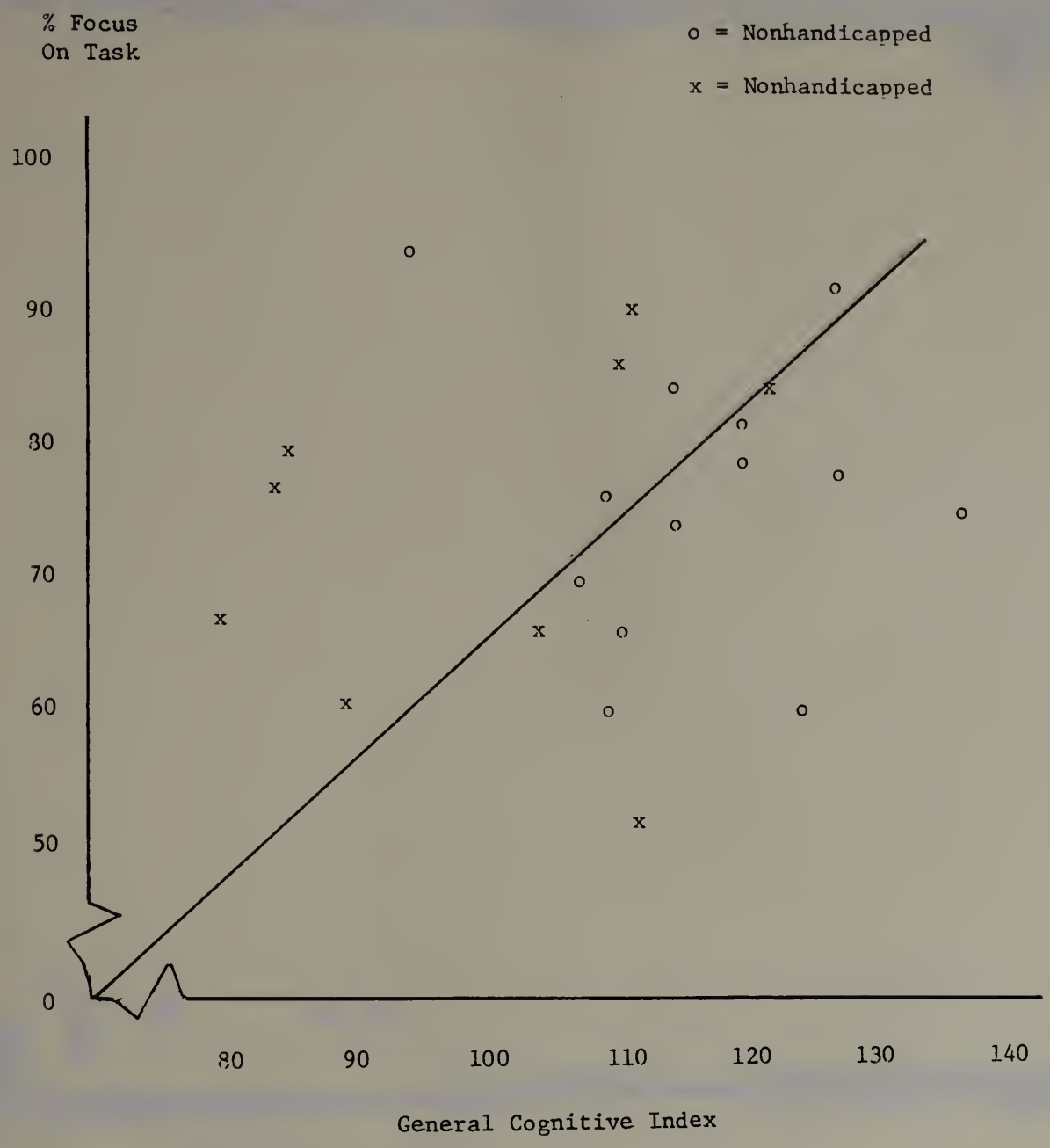
The null hypothesis that there was no significant increase in Focus On Task was rejected. A one-tailed paired t-test revealed a significant increase in on-task behavior from November 1979 to May 1980 and a substantial, but not significant, increase in on-task

behavior from October 1980 to May 1981.

Because some handicapping conditions interfere with children's ability to attend to tasks, it was hypothesized that a statistically significant difference would exist between handicapped and nonhandicapped children's on-task behavior. Raw data were examined for variability in on-task behavior within the handicapped group of children and within the nonhandicapped group of children. Children without expressive language ability revealed lower percentages for Focus On Task behavior than other handicapped and nonhandicapped children. When this group of severely handicapped children was partialed out, there was no significant difference in observed frequency of on-task behavior between handicapped and nonhandicapped children.

A stepwise multiple regression ruled out the hypothesis that teacher role was the best predictor of on-task behavior for children attending this integrated preschool from 1979 to 1981. In only one of four time periods, spring 1980, was Teacher Role able to make a significant contribution to the variance. It was hypothesized that Learning/Activity Area would be a good predictor for the criterion variable, Focus On Task. Over all four time periods, the behavior setting or activity area of the classroom was the best predictor of on-task behavior.

Figure 2. Scatter diagram illustrating the lack of correlation between Focus On Task and General Cognitive Index for 9 handicapped and 13 nonhandicapped children who attended an integrated preschool program.



CHAPTER V

SUMMARY AND CONCLUSIONS

Introduction

This post hoc analysis of data gathered between 1979 and 1981 in an integrated handicapped, nonhandicapped preschool was designed to assess the relative frequency of observed on-task behavior over time and to explore possible relationships of children's on-task behavior to several independent environmental variables: teacher role, child group size, and activity or learning area of the classroom. Results of this study must be considered in the context of a longitudinal case study with limited applicability to other mainstreamed preschools.

Viewed as a case study, this research has an exceptionally sound data base. A total of 2,633 observations was gathered on 14 handicapped and 13 nonhandicapped children during two-week observation periods in November 1979, May 1980, October 1980, and May 1981. In the fall of 1979, a total of 648 30-second observations was gathered of the behavior of handicapped (N = 10) and typical (N = 9) children. In the spring of 1980, 610 cases were recorded of handicapped (N = 9) and typical (N = 8) children. The following year, 680 observations were gathered in the fall from the population of handicapped (N = 9) and typical (N = 9) children in attendance. In the spring of 1981,

handicapped (N = 10) and typical (N = 9) children yielded a total of 695 observations. On-site interrater reliability was established prior to each observation period and observer agreement of at least 80% was consistently maintained.

Children were randomly selected for a series of five 30-second observations as they participated in routine preschool activities. The frequency of on-task behavior was coded throughout the morning for seven to ten consecutive days until approximately 40 observations were gathered on each child. A child was considered to be Focused On Task when involved in an activity, task or project alone, with other children or with adults. The target child must have been clearly focused on materials, an activity, or the persons included in the task or activity. In order to be coded as Focused On Task, the child might be rolling a large ball across the rug in the gross motor area during the 30-second observation period or perhaps sitting quietly listening to a record in a more sedentary activity.

In addition to the frequency of observed on-task behavior, the activity or learning area where the behavior occurred, the size of the child group, and the teacher role were recorded for each behavioral observation. Six Learning/Activity Areas which remained constant across all four time periods of this research project were included in the analysis: (a) Art Area, (b) Block Area, (c) Large Group Meeting, (d) Sensorial Area, and (e) Snack Activity. Size of the child group was separated into four categories: (a) alone, (b) two to five children

(c) more than five but fewer than the whole group, and (d) all of the children. Four general categories of adult behavior were simultaneously recorded: (a) Absent, (b) Observing, (c) Participating, and (d) Directing.

Conclusions

Based on the ecological paradigm which facilitates investigation into the interconnectedness between the developing child and the surrounding ecosystems (Apter, 1977; Bronfenbrenner, 1979; Gordon, 1978), four research hypotheses were posed. It was hypothesized that mean per cent on-task behavior of children would not change significantly from fall to spring of each preschool program year. A one-tailed paired t-test, self pairing each child's mean per cent on-task fall behavior with her mean per cent on-task spring behavior, caused rejection of this null hypothesis. There was a significant increase in mean per cent Focus On Task behavior from fall 1979 to spring 1980 and a substantial, but not significant, increase in mean per cent on-task behavior from fall 1980 to spring 1981 at the .05 level of significance.

This finding might contradict a strict behaviorist view of the environment-behavior relationship but it is not inconsistent with the ecological paradigm stemming from Lewin's field theory. In essence, the behaviors of any organism are both influenced by the environment and, conversely, influence the environment (Day, 1983). In Early

Childhood Education: A Human Ecological Approach, Day illustrated how a prior experience of one child affected her own and other children's behavior within a preschool environment. An increase in Focus On Task behavior for developing children within a dynamic environment is quite consistent with this transactional approach.

General cognitive index and on-task behavior

An exploratory analysis was carried out to assess general cognitive test scores at the time children entered the integrated program and posttest McCarthy scores at the time they departed. The McCarthy Scales of Children's Abilities was administered to 12 nonhandicapped and 4 handicapped children upon enrolling in the integrated program. In the spring of 1980, McCarthy posttests were administered to four nonhandicapped children departing from the program. In spring 1981, both handicapped (N = 7) and nonhandicapped (N = 9) children received McCarthy posttests. There was no gain in General Cognitive Index from pretest to posttest periods. General Cognitive Test scores are reported in the appendix.

A scatterplot (Figure 2) showed no relationship between either handicapped or nonhandicapped children's general cognitive posttest scores and their on-task behavior for the same time period upon completing their tenure in the program. This is striking in light of the fact that a review of the literature in Chapter II uncovered a plethora of studies which reported a positive correlation between on-task behavior and scores on achievement and IQ tests.

All of the studies reported in Bloom's (1976) review of the literature revealed a positive correlation between on-task behavior and achievement. Borg (1980) reviewed studies investigating the relationship between engaged time and achievement and concluded that cumulative research evidence over the past 36 years shows consistent positive relationships between time-on-task and achievement. In the six-year BTES study of reading and mathematics at the elementary school level, Fisher, Berliner, Filby, Marliave, Cahen, Dishaw and Moore (1978) found a high correlation with achievement when the student was engaged in task related material over time.

Karweit (1983) discussed the recent hoopla over time-on-task in educational research. She conceded that the connection between student on-task behavior and learning is well documented but she states that "It is difficult to argue with this almost definitional assertion that more time produces more learning. Given the commonsense nature of the assertion, it perhaps is most surprising that so much attention has been paid to it" (Karweit, 1983, p. 46). Karweit reviewed the BTES and seven other task involvement research studies and concluded that the most remarkable finding resulting from her review of time-on-task literature is that time is not more highly correlated with learning after controlling for initial ability (Karweit, 1983). Karweit's (1983) assertive statements should be cautiously weighed against the small number of studies reviewed and her errors in reporting data from these eight studies.

The six-year BTES study utilized Academic Learning Time (ALT), which is an on-task measure defined as the amount of time the student is engaged in academically relevant material with a moderate level of difficulty. In their comparison of Florida preschool children and children in Oxford, England, Sylva, Boy, and Painter (1980) discovered that British children spent 18 per cent more time engaged in intellectually challenging activities.

In the preschool program under study, no qualitative measure of on-task behavior was included. A child was coded as being on-task when involved in an activity, task, or project while alone, with other children, or with adults. The type of activity and the level of cognitive challenge of that activity were not coded. It may be that this preschool program which--like many other integrated preschool programs--placed a high priority upon social interaction between handicapped and nonhandicapped children, did not provide a sufficient range of materials, activities, and experiences to meet the broad intellectual needs of this cognitively diverse group of children.

Teacher Role and Focus On Task

Why was Teacher Role not a better predictor of on-task behavior of children in this integrated preschool? In her review of preschool teacher behavior research, Phyfe-Perkins (1981) considers indirect teacher effects as well as direct teacher effects on preschool children. Indirect teacher effects include environmental arrangements such as scheduling, organization, and space/time placement of

equipment and activities, i.e., task involvement is fostered by the provision of sufficient construction material which is inherently self reinforcing (Phyfe-Perkins, 1981). In another review of physical environment influences, Phyfe-Perkins (1980) concludes that while physical space and materials promote behavioral expectations, the most important variables in an early education setting are teacher behavior and program format.

There are several methodological problems with preschool on-task behavior research literature. First, when researchers postulate a relationship between on-task behavior and an independent variable such as teacher role, a simple correlation or analysis of variance may reveal a relationship but it cannot be assumed that teacher behavior is the causal agent. The causal relationship may be reversed. The behavior of the child may cause a change in the behavior of the teacher. The way a teacher interacts with a severely handicapped child without productive speech may be entirely different from the way the same teacher interacts with a child with expressive language capability.

Second, researchers are suseptible to culture bound beliefs such as inherent worth of democratic teaching practice. The type of research question addressed and the method of analysis reflect the social-cultural bias of the researcher. It is difficult for a researcher to ignore the fundamental societal belief in equality of educational opportunity, for example, when investigating the behavior of preschool children in an integrated handicapped, nonhandicapped center.

Third, commonly accepted independent variables--teacher behavior, age, social class, cognitive ability--may not be as potent in predicting child behavior as generally assumed. Environmental variables must be considered as potential sources of variability in child behavior. In the present study, the stepwise multiple regression analysis showed Teacher Role to be a significant variable in only one out of four time periods examined, while Activity/Learning Area was the best overall predictor of children's on-task behavior for all four time periods.

Learning/Activity Area and on-task behavior

The extraindividual unit, the behavior setting, is an integral component in Barker's (1978) conceptualization of the ecological paradigm which facilitates investigation of behavior-and-context patterns. The standing pattern of behavior and the milieu to which the behavior is attached combine to form the behavior setting (Barker, 1978). Based on the synomorphic relationship between the standing behavior pattern and its milieu, it was hypothesized that Learning/Activity Area would be a good predictor of Focus on Task behavior of children in this integrated preschool.

Six Learning/Activity Areas which remained constant over a two-year period from fall 1979 to spring 1981 were included in this analysis: (a) Art Area, (b) Block Area, (c) Book Area, (d) Large Group Area, (e) Sensorial Area, and (f) Snack Time. A stepwise regression revealed that Learning/Activity Area of the classroom

was the best predictor of children's on-task behavior in terms of the amount of variance accounted for by Learning/Actity Area across all four time periods.

Implications

This post hoc analysis of data gathered in an integrated handicapped, nonhandicapped preschool investigating the impact of environmental variables on the dependent variable Focus On Task has several implications for future research.

Implication 1

There was no significant difference between percentage on-task behavior of handicapped and nonhandicapped children with expressive language ability. However, severely handicapped children without speech were Focused On Task significantly less than all other handicapped and nonhandicapped children during spring 1980 and 1981 observation periods. These results must be cautiously interpreted because of the small number of handicapped children without speech observed. The fall 1979 data are based on a total of 96 observations of four children without speech; the spring 1980 data are based on 131 observations of four children without speech: the fall 1980 data are based on only 49 observations of two children without speech: and the spring 1981 data are based on 80 observations of three children without speech. More research is needed to determine whether this

typology differentiating children lacking speech ability from other handicapped and nonhandicapped children will be useful in planning mainstreamed preschool environments.

Implication 2

Sylva, Roy, and Painter (1980) question whether all activity in preschools is equally valuable. They point out that one child's task-oriented behavior may be more complex than another child's occupation with the same type of activity and that some traditionally praised unstructured materials such as water, sand, and playdough do not stretch children's cognitive ability (Sylva et al., 1980).

In the integrated preschool under study, McCarthy posttest General Cognitive Index scores show no correlation with percentage on-task behavior gathered within the same time period. This lack of correlation was found for both handicapped and nonhandicapped children. Furthermore, there was no difference in General Cognitive Index scores from pre- to posttest periods.

This unexpected finding was inconsistent with the literature reviewed in Chapter II. It is possible that while children attending this integrated preschool were highly task involved, there was insufficient cognitive challenge within and across activities. Further research is needed to develop ways of measuring cognitive challenge and to uncover the relationship between time-on-task and cognitive challenge. It is suggested that future research of on-task behavior in integrated handicapped, nonhandicapped preschools build

upon the measure of intellectual challenge developed by Sylva, Roy, and Painter (1980).

Implication 3

A limited amount of research has been conducted concerning the effects of preschool heterogeneous vs. homogeneous age grouping on child development (Dixon, 1978; Freedman, 1982; Hammack, 1975; Hartup, 1977; Mycock, 1967; Wakefield, 1979). In most countries, preschool children are grouped by single year of age (Austin, 1976), although recent educational experiments in Sweden have included heterogeneous grouping of children 2½ to 7 years of age together (Freedman, 1982) and Montessori schools throughout the world commonly group children 2½ to 5 years of age together. Freedman (1982) concludes from her review of the literature that multi-age grouping has distinct advantages for language development and social/emotional development but that homogeneous groups appear to be more effective for mastering specific academic skills (Freedman, 1982).

An approximate age span of two years existed in the integrated handicapped, nonhandicapped preschool studied. Within the population which included severely handicapped to typical children, however, the developmental age span was much greater. It is possible that the grouping of children with diverse cognitive ability did not optimally facilitate intellectual growth. Future educational experiments should be conducted to test the effects of mainstreaming handicapped children with nonhandicapped children of similar cognitive ability.

Implication 4

Within education settings, the teacher has been assumed to be the major source of significant input to the child (Gump, 1978). Teacher role research findings are summarized by Dunkin and Biddle (1974) who report that pupils are more likely to be involved when the teachers role is central than when it is not. However, Dunkin and Biddle's extensive review of research on teaching is not concerned with " . . . investigations conducted with white rats, monkeys, planaria, or preschool children" (Dunkin & Biddle, 1974, p. 3).

Sears and Dowley (1963) and Phyfe-Perkins (1981) review preschool teacher behavior research. Phyfe-Perkins (1981) concludes that effective preschool teachers are: (a) encouraging; (b) use positive types of instruction; (c) are involved with children's activities: and (d) are child-centered.

In the present investigation of children's on-task behavior in an integrated handicapped, nonhandicapped preschool, teacher role made a significant contribution to variance of children's on-task behavior in only one of four time periods. During the spring 1980 observation period, Teacher Role accounted for approximately 30 per cent of the variance in Focus On Task when a stepwise multiple regression procedure was used. During this time period (spring 1980), handicapped and nonhandicapped children were coded as Focused On Task in 64 per cent of the observations when the teacher was Absent; 80.7 per cent on-task with a teacher Observing; 83.6 per cent on-task with the teacher participating, and 57.9 per cent with the teacher Directing. Further

research would need to be conducted before any significance was attached to the high percentages of on-task behavior while the teacher was Observing and Participating during this one observation period.

Implication 5

Doyle (1977) categorizes teacher behavior research into three paradigms: (a) The process-product paradigm includes studies investigating the relationship between teacher behavior and student learning outcomes. (b) The mediating process paradigm takes into account the mediating influence of students in determining what is processed and remembered. (c) The classroom ecology paradigm considers a variety of contextual variables. Doyle (1977) speculates that the ecological paradigm may change the type of research question addressed.

In an observational study of daycare programs in Massachusetts, Day and Sheehan (1974) identified three contextual variables which effect the behavior of preschool children: (a) the physical setting and utilization of space; (b) the availability and use of materials; (c) the amount and type of adult-care interaction. Unless these contextual variables are considered in planning integrated handicapped, nonhandicapped preschool environments, there is little hope that mainstreaming will improve the quality of preschool education for either handicapped or typical children.

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APPENDICES

BEHAVIOR CHECKLIST SUMMARY DATA

Child_____

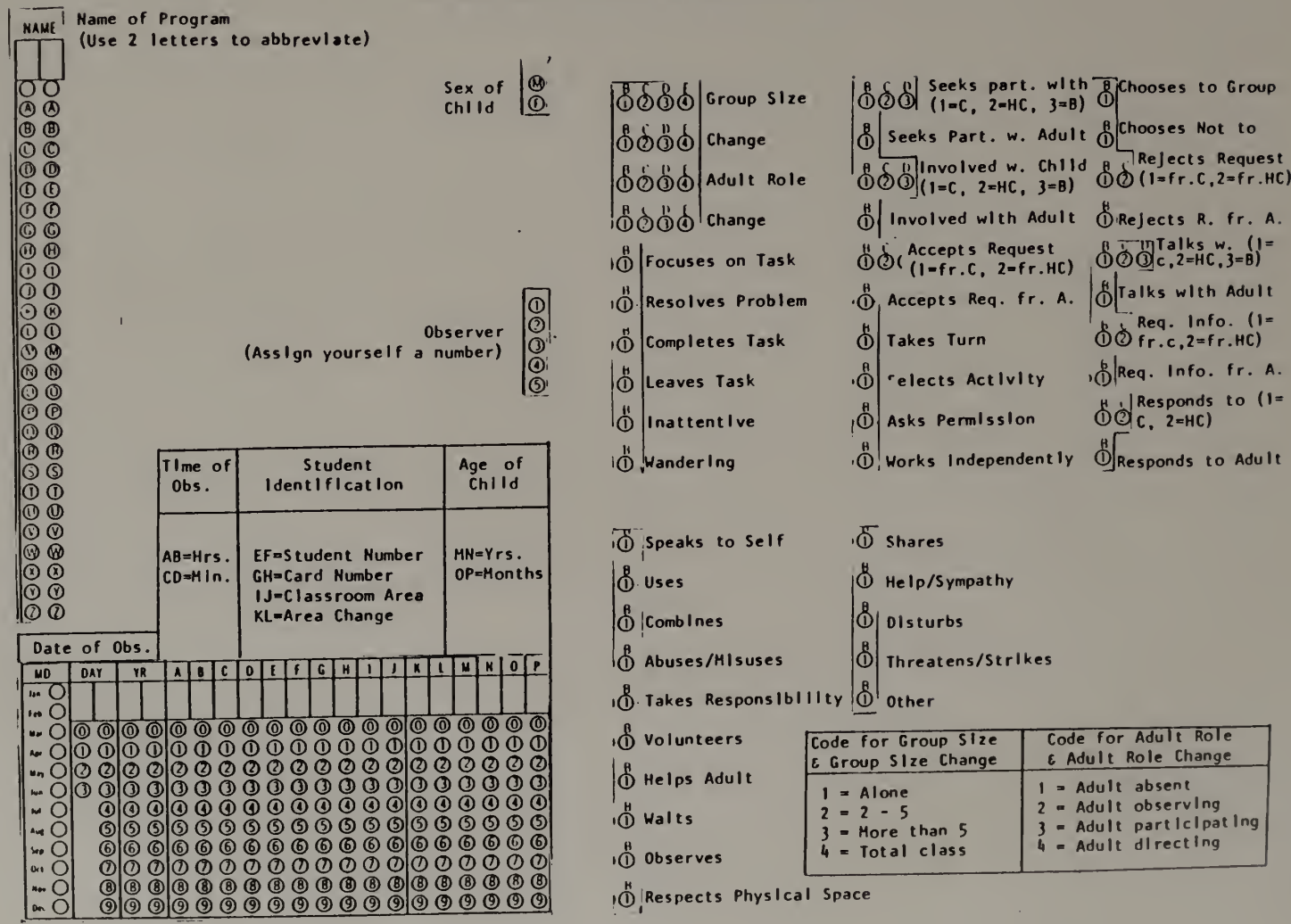
Observation Date_____

Data Points_____

BEHAVIORS

TASK INVOLVEMENT	Focuses on task					
	Resolves problem					
	Completes task					
	Leaves task					
	Inattentive					
	Wandering					
COOPERATION	Seeks participation C/A	C A H				
	Involved C/A /H					
	Accepts request C/A /H					
	Takes turn					
AUTONOMY	Selects activity					
	Asks permission					
	Works independently					
	Chooses to group					
	Chooses not to					
	Rejects request C/A	C A H				
VERBAL INTERACTION	Talks with C/A /H					
	Requests info. C/A/H					
	Responds to C/A/H					
	Speaks to Self					
MATERIALS	Uses					
	Combines					
	Abuses/Misuses					
MAINTENANCE	Takes responsibility					
	Volunteers					
	Helps adult					
	Waits					
CONSIDERATION	Observes					
	Respects physical sp.					
	Shares					
	Help/sympathy					
	Disturbs					
	Threatens/strikes					
	Other_____					

THE BEHAVIOR CHECKLIST DATA SHEET TEMPLATE



PERCENTAGE FOCUS ON TASK

I. Nonhandicapped Children

Child	Fall 1979	Spring 1980	Fall 1980	Spring 1981
1	61	58		
2	60	75		
3	68		91	73
4	60	80	85	73
5	85	77		
6	71	80	80	64
7	85	78		
8	63	65	83	88
9	71	72	84	83
10			66	75
11			62	94
12			59	57
13			67	69

II. Handicapped Children

Child	Fall 1979	Spring 1980	Fall 1980	Spring 1981
1	42	53		26
2	76	60		
3	0	49	9	36
4	60	85		
5	62	76	89	77
6	67		93	89
7	44	80	69	78
8	63	60	65	51
9	43	90		
10	50	62		
11			13	80
12			38	66
13			87	83
14			80	65

McCARTHY SCALES OF CHILDREN'S ABILITY GENERAL COGNITIVE TEST SCORES AND OBSERVED PERCENTAGE FOCUS ON TASK AT TIME OF POST-TEST

I. Nonhandicapped Children

Pre-test Date	Gen. Cog. Score	Post-test Date	Gen. Cog. Score	% Focus On Task
1/22/79	111	5/13/80	109	58
10/18/79	113	5/27/80	109	75
9/27/79	116	5/7/81	115	73
10/18/79	131	4/3/81	137	73
10/11/79	129	5/13/80	127	77
10/4/79	118	6/12/81	111	64
10/18/79	128	5/20/80	121	78
9/20/79	124	4/3/81	127	88
9/27/79	111	4/23/81	114	83
9/26/80	126	4/10/81	120	75
9/26/80	115	4/23/81	124	57
9/24/80	103	6/12/81	107	69
		5/29/81	96	94

II. Handicapped Children

Pre-test Date	Gen. Cog. Score	Post-test Date	Gen. Cog. Score	% Focus On Task
11/1/79	75	4/22/81	85	77
1/1/80	118	5/1/81	112	89
1/1/80	77	5/15/81	84	78
10/7/80	124	4/22/81	122	83
		4/81	113	51
		6/5/81	80	66
		5/15/81	103	65
9/27/79	104	5/20/80	111	85
10/4/79	93	5/27/80	89	60

Fall 1979

ACTIVITY/AREA DESCRIPTION

Activity/area: Arts and Crafts Area (David E. Day 9/78)

Location:
In a separate room across from the Snack Area

No. of children at one time:
Table: 4; Easel: 3

Adult role(s):
Observe
Participate

Child role(s):
Work, play, enjoy, learn, teach, experiment, explore.

Materials available:
Paint, paper, brushes, aprons
Play dough
2 rolling pins
Collage materials
Other art materials

Equipment:
Easel
2 tables
6 to 10 chairs

Equipment/material display:
Paints and brushes at easel
Aprons hanging on easel
Paper nearby on floor
Art table materials accessible on low shelf

Time of activity/area:
Open during the morning, with the exception of group time, snack time, and the first half hour.

Purpose (or child development goals):
Independence
Eye-hand coordination
Verbal interaction
Social experience
Tactile discrimination
Cooperation
Motivation
Place for modeling, imitation

Behavior Check List behaviors (reflecting child development goals):
TASK INVOLVEMENT
COOPERATION
AUTONOMY
VERBAL INTERACTION
MATERIALS
MAINTENANCE
CONSIDERATION

Fall 1979

ACTIVITY/AREA DESCRIPTION

Activity/area: Block Area (David E. Day 9/78)

Location:
Separated by shelves from the Gross Motor Area; Adjacent to the joint Book and Large Group Areas.

No. of children at one time:
4 comfortably

Adult role(s):
Observe; Assist

Child role(s):
Build, measure, fantasy play, talk, explore, laugh, clean up.

Materials available:
Unit blocks, Small train set, Road signs, Pliable doll family, Wooden trucks & cars, Red rods, Brown stair, Pink Tower, Doll house furniture.

Equipment:
1 shelf
1 rug
doll house

Equipment/material display:

Shelf and floor

Time of activity/area:

9:20 - 11:40 a.m.

Purpose (or child development goals):

Provide place for social interaction

Promote sharing

Develop visual discrimination

Encourage creativity

Combine and associate different materials in the area

Develop eye-hand coordination

Encourage imitation, dramatic play, role modeling

Learn to replace materials

Behavior Check List behaviors (reflecting child development goals):

TASK INVOLVEMENT

COOPERATION

VERBAL INTERACTION

MATERIALS
Incorporates: Combines

MAINTENANCE

CONSIDERATION

Fall 1979

ACTIVITY/AREA DESCRIPTION

Activity/area: Book Area (David E. Day 9/78)

Location:
Shares space with Large Group Area; Adjacent to Block and one-to-one Areas.

No. of children at one time:
No restriction

Adult role(s):
Observes;Directs - All media
Participates

Child role(s):
Reads - Explores books
Listens
Looks at pictures of selves
Talks; laughs

Materials available:
48 books
6 records
Fish tank
Basket of animals
tissues

Equipment:
4 shelves
Rug
Record player
Tape recorder
Slide projector

Equipment/material display:

The books are laid flat on all 4 shelves. Fish tank and record player are on top of shelves.

Time of activity/area:

Children may use the book area as outlined above at any time except group time.

Purpose (or child development goals):

Enhance language and speech

Encourage love of books

Provide quiet activity

Explore feelings and stimulate conversation

Develop sensitivity to handicapping conditions

Enjoy visual aspect of books

Prepare to read; reading readiness

Behavior Check List behaviors (reflecting child development goals):

TASK INVOLVEMENT
- Focuses on Task
- Resolves Problem
- Completes Task

Verbal interaction

MATERIALS
- Uses
- Combines

Fall 1979

ACTIVITY/AREA DESCRIPTION

Activity/area: Large Group Meeting (David E. Day 9/78)

Location:
Shares space with Book Area; Adjacent to Block and One-to-One Areas

No. of children at one time:
whole group

Adult role(s):
Direct; Observe; Participate

Child role(s):
Participate; observe, learn, play, work, experiment.

Materials available:
Rhythm instruments - given out at teacher's discretion.

6 records - played at teacher's discretion

Equipment:

Record player

Equipment/material display:

Low open shelf
Carpet on floor

Time of activity/area:
9 a.m. to 9:15 or 9:20 a.m. and 11:40 a.m. to 12 noon.

Purpose (or child development goals):
Verbal interaction

Social interaction

Verbal expression

Stimulated activities

Respond to teacher-directed activities in group setting

Body expression and control and response to musical direction

Cooperative social responses

Behavior Check List behaviors (reflecting child development goals):
COOPERATION
CONSIDERATION
VERBAL INTERACTION
- Talks with C/A
- Requests Info. C/A
- Responds to C/A
- Talks to self

MATERIALS
- Uses; combines

MAINTENANCE
- Takes responsibility
- Volunteers Helps Adult

CONSIDERATION
- Observes; Respects physical space
- Shares; Helps/Sympathy

Fall 1979
ACTIVITY/AREA DESCRIPTION

Activity/area: Sensorial Area (David E. Day 9/78)

Location:
Near Quiet Corner Area and across from Gross Motor Area.

No. of children at one time:
1 - 7

Adult role(s):
Teacher; Facilitator

Child role(s):
Explore materials (listen, touch manipulate)
Replace materials
Work in small group or alone

Materials available:
Knobless cylinders; Beads;
Color tablets; Matching excercises;
Puzzles; Lotto;
Spindle boxes;
Sandpaper numerals

Equipment:
Tables
Chairs
Shelves

Equipment/material display:
Low shelves

Time of activity/area:
9:20 - 11:40 a.m.

Purpose (or child development goals):
Develop small muscle control through fine motor excerises

Develop eye-hand coordination through manipulation of materials

Develop social skills through interaction with others

Develop self discipline

Develop independence

Develop visual discrimination

Enhance auditory discrimination

Develop perceptual awareness

Learn how to cooperate

Develop creativity

Behavior Check List behaviors (reflecting child development goals):

TASK INVOLVEMENT

COOPERATION

AUTONOMY

VERBAL INTERACTION

MATERIALS

MAINTENANCE

CONSIDERATION

Fall 1979

ACTIVITY/AREA DESCRIPTION

Activity/area: Snack Area (David E. Day 9/78)

Location:
Adjacent to the Arts and Craft and Storage Areas

No. of children at one time:
whole group

Adult role(s):
Observes; Directs
~~Participates~~

Child role(s):
sits; Observes silence
Eats snack; Socializes
Takes care of cup & napkin when finished

Materials available:
Napkins
Cups
Bowls
Food

Equipment:
2 Tables
Chairs
Shelf

Equipment/material display:
A small shelf with snack items is located next to the sink. The wastebasket is near the door leading into the main classroom.

Time of activity/area:
Approximately 10:30 - 10:45

Purpose (or child development goals):
Encourage social interaction

Elicit spontaneous speech

Learn or improve feeding skills

Learn organization and clean up habits

Provide nourishment

Learn hygiene rel. to handling food

Give children pleasure

Encourage modeling

Answer questions in a complete group setting

Develop attention span (i.e., observe moment of silence)

Behavior Check List behaviors (reflecting child development goals):

TASK INVOLVEMENT
- Focusis on Task
- Resolves Problem
- Completes Task

VERBAL INTERACTION
- Talks with C/A
- Requests information C/A
- Responds to C/A

MATERIALS
- Uses

MAINTENANCE
- Takes responsibility
- Volunteers
- Helps Adult

Fall 1980

ACTIVITY/AREA DESCRIPTION

Activity/area: Art Area (David E. Day 9/78)

Location:

In a separate room across from the Snack Area

No. of children at one time:
2 - 7

Adult role(s):
Observes; Participates

Child role(s):
Children will work and play and in the process will learn, experiment, share, explore, expand ideas, and have fun.

Materials available:

Playdough	Plexiglas easel
Cutting tools	Paint
Wisk brooms	Brushes
Plants	Paper
Glue	Smocks
Sissors	Cookie cutters
Magic markers	Rolling pins
Clay boards	

Equipment:
Rectangular table
Six chairs
Round table
Five chairs
Two shelves

Equipment/material display:
Paints and brushes are at the easel, aprons hang beside the shelf. Art materials are accessible on low shelves.

Time of activity/area:
An art activity is usually set up right after the morning meeting until preparation for snacktime.

Purpose (or child development goals):

Develop creativity through free form art projects

Stimulate visual and tactile impressions

Build skills through natural activity

Encourage the expression of feelings through natural activity and representational play

Behavior Check List behaviors (reflecting child development goals):

Children would be involved in both autonomous and interaction modes of behavior. They would be focused on task most of the time and would be expected to consider the rights of their friends and maintain the environment after use of materials.

Fall 1980

ACTIVITY/AREA DESCRIPTION

Activity/area: Block Area (David E. Day 9/78)

Location:

Separated by shelves from the Sensorial Area; Adjacent to the joint Book and Large Group Areas.

No. of children at one time:

4 comfortably

Adult role(s):

Observes; Absent

Child role(s):

Builds, measures, engages in fantasy play, talks, explores, solves social problems and cleans up.

Materials available:

Broad stair	Unit blocks
House	Dolls
Farm & zoo animals	Furniture
Large leggos	Traffic signs
Wooden train	Red rods
Tracks	
Pink tower	

Equipment:

2 shelves
Farm
Doll house
Rug

Equipment/material display:

The material is displayed on both the shelves and the floor.

Time of activity/area:

This area is available for use except during large group meetings, snack, and outdoor time.

Purpose (or child development goals):

Develop creativity in combining materials

Help children learn to include someone else in something they've just done

Develop eye-hand coordination

Encourage successful manipulation of materials

Provide a place for fantasy play

Promote social interaction

Encourage imitation, dramatic play and role modeling

Learn to replace materials

Behavior Check List behaviors (reflecting child development goals):

Children would be cooperatively involved with a lot of child-child verbal interaction. Materials use is high as well as maintenance and consideration behavior.

Fall 1980

ACTIVITY/AREA DESCRIPTION

Activity/area: Book Area (David E. Day 9/78)

Location:

Shares space with Large Group Area; Adjacent to Block Area.

No. of children at one time:

No restriction

Adult role(s):

Participates

Child role(s):

The child uses this area as a place for quiet discussion and exploration of handicaps, feelings, events, and fantasy.

Materials available:

33 books on display rack
16 books on flat shelf
Button and zipper frames
Texture sample frames
Pocket radio music box
Stacking toy
Stuffed animals

Equipment:

Shelf; Book display rack
Pillows; Record player & records
Two wooden support chairs for handicapped children

Equipment/material display:

Books are displayed on a standing display rack as well as on flat shelves. The record player is an adult supervised activity on top of the shelf.

Time of activity/area:

Available except during large group activity, snack, and during outdoor activity.

Purpose (or child development goals):

Enhance language and speech

Encourage love of books

Provide quiet activity

Explore feelings and stimulate conversation

Develop sensitivity to handicapping conditions

Enjoy visual aspect of books

Prepare to read; reading readiness

Enjoy fantasy stories

Behavior Check List behaviors (reflecting child development goals):

Children would be seen working independently here as well as one-to-one with adults with some verbal interaction and focused on-task behavior. They would be seen using materials (especially books).

Fall 1980

ACTIVITY/AREA DESCRIPTION

Activity/area: Large Group Meeting (David E. Day 9/78)

Location:

Shares space with Large Group Area; Adjacent to Block Area.

No. of children at one time:
Total Group

Adult role(s):
Directs; Observes; Participates

Child role(s):
The child participates, observes, learns, plays, works, and experiments.

Materials available:
Children would not be expected to be using materials during the large group meeting time except on occasion when rhythm band instruments are made available by the teacher.

Equipment:
Record player
Rug
3 shelves with books
1 child sized rocking chair
1 adult sized rocking chair

Equipment/material display:
The area is the same as the book area. However, the books are not used by the children during large group meetings. Rhythm instruments are kept on the floor in a box behind a shelf.

Time of activity/area:
9:00 - 9:15 a.m.
11:40 - 12 noon

Purpose (or child development goals):
Verbal interaction & expression

Social interaction

Ability to accept adult direction

Learning to respond appropriately to teacher-directed activities in a group setting

Develop attention span

Learn to listen

Develop body expression and control in response to music

Develop cooperative social responses

Help create an understanding of and tolerance of individual differences

Behavior Check List behaviors (reflecting child development goals):

Consideration behaviors and taking turns are important behaviors anticipated in the large group meeting area. There should be some responds to adult and verbal interaction as well.

Fall 1980

ACTIVITY/AREA DESCRIPTION

Activity/area: Sensorial Area (David E. Day 9/78)

Location:
Next to the Block Area and across from the Gross Motor Area

No. of children at one time:
1-7

Adult role(s):
Directs; Participates; Observes

Child role(s):
The child explores materials and works alone or in a small group, replacing material after use.

Materials available:

Knobless cylinders	Karascope
Color box # 1	Knobbed cylinders
Color box # 2	Broad Stair
Spindle box	Geometric blocks
10 puzzles	Binomial cube
Metal insets	Colored cubes
Peg board	Bristol blocks
Plastic screw & nut	

Equipment:
Red table with two chairs
Three shelves
Wooden table with four chairs

Equipment/material display:
Materials are displayed on the three shelves which enclose the area.

Time of activity/area:
Children are free to use this area except when involved in total group activities.

Purpose (or child development goals):

Develop fine motor skills

Develop creativity

Develop social skills through interaction with others

Develop self-discipline

Encourage independence

Develop visual discrimination

Enhance auditory discrimination

Develop perceptual awareness

Learn how to cooperate

Behavior Check List behaviors (reflecting child development goals):

On task and completes task are particularly important behaviors to observe in this area. Autonomous behaviors would also be expected. Cooperative behaviors, verbal interaction and respect for physical space of others are expected to some extent.

Fall 1980

ACTIVITY/AREA DESCRIPTION

Activity/area: Snack Area (David E. Day 9/78)

Location:

Adjacent to the Arts and Craft and Storage Areas

No. of children at one time:

Total Group

Adult role(s):

Observes; Directs; Participates

Child role(s):

Sits, observes silence
Socializes while eating snack
Takes care of cup & napkin

Materials available:

Towels	Flatware
Soap	Bowls
Plastic glasses	Food
Dishes	Water
Napkins	
Pitchers	

Equipment:

2 containers for washing and rinsing hands
2 containers for washing and rinsing dishes
2 tables; 11 chairs

Equipment/material display:
Tables occupy most of the room.
Shelf with snack materials.
Dishwashing set up along the wall.
Handwashing set up near the entrance.

Time of activity/area:

Approximately 10:30 - 10:45 a.m.

Purpose (or child development goals):

Encourage social interaction

Elicit spontaneous speech

Learn or improve feeding skills

Learn organization & clean up habits

Provide nourishment

Learn hygiene in handling food

Give children pleasure

Encourage modeling

Develop fine motor skills

Develop attention span (as the moment of silence is observed)

Learn pre-math skills such as counting and correspondence

Behavior Check List behaviors (reflecting child development goals):

Verbal interaction, both child-child and child-adult would be expected to be frequently observed.

Cooperation and consideration are also behaviors which would indicate that child development goals are being met.

Autonomy behaviors would indicate goals are being met, as well as frequently observed maintenance behaviors.